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THE PAPER TRADE JOURNAL.

"The Consumption of Paper is the Measure of a People's Culture."

VOLUME XXIII.—NO. 48. NEW YORK, DECEMBER 1, 1894. WHOLE NUMBER 1074.

Trade Topics.

Turbine Water Wheels.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By Sanford E. Thompson.

(Concluded.)

Horizontal turbine wheels are largely used to avoid bevel gears. They may either be set in a wooden or masonry penstock in a similar manner to the common construction for vertical wheels except that the shaft passes through a stuffing box in the side, or the penstock may be entirely of iron. Horizontal wheels cannot be used under low heads, nor where the level of the head water is too variable, because the top of the wheel and case is higher above the deck than that of a vertical wheel. If there is not sufficient water above them air will be drawn through the wheel with the water and the efficiency will be reduced.

Much has been said of the advantages in a ground wood pulp mill of driving each grinder with a separate horizontal turbine. It is true that this is very convenient for shutting off the grinder to change the stone or make repairs, but it has the disadvantage of less steadiness of motion than where several grinders are driven from one wheel. If several stones are placed on one shaft they may be fed at different times, and with efficient turbines a very even speed may be maintained, producing a uniform quality of pulp. When constructing a flume for either vertical or horizontal wheels it is often a good plan to build so that the shaft may be extended at any time and one or more extra wheels put in to provide additional power.

In a mill driven by water wheels lack of power will occur when the water is low and the head is drawn down, and also when the water is extremely high and the tail water backs up onto the wheels. The effect of the latter can be overcome, when it is advisable to incur the extra expense, by putting in another set of wheels, for in high water there is always a sufficient quantity of water to run extra wheels. Additional wheels will be of no use, however, when the water is low.

Some of the various causes for lack of power have been mentioned and they may be summarized as follows: Inferior wheels; poor alignment of wheel shafting, due to settling of the flume or swelling of the timbers; back water in the headrace, due to a narrow canal or obstructions in it; back water in the tail water, due to a narrow race or to small wheel pits; temporary low water or back water, due to natural causes; clogging of racks by anchor ice or other matter which floats down the river; clogging of the wheels themselves by anchor ice or brushwood.

In order to be sure that one is getting a wheel of an efficiency equal to its guaranty, it is advisable to have it tested before putting it in place. The only testing flume especially arranged for this work is located at Holyoke and owned by the Holyoke Water Power Company, and is used by it partly for testing the water wheels of its customers located at Holyoke, and in part for testing any wheels which may be sent to it for examination. At Holyoke a certain proportion of the users of water pay an annual rental, while the remainder hold "surplus powers." "Surplus powers" are paid for according to the amount of water used per day. The wheels have previously been tested in the testing flume, and a curve drawn for each one, showing the amount of water used by that wheel at various gate openings. Twice in every twenty-four hours, while the wheel is in operation, observations are made by the Water Power Company of the opening of the speed gate to determine the quantity of water used. It will be seen that it is especially necessary in cases where the power is measured in this way that the water wheel shall be of high efficiency both at full gate and at part gate openings.

The flume used for testing the wheels is fitted so that extremely accurate observations may be made. The water is brought from the canal through a wrought iron conduit about 9 feet in diameter into a penstock 20 feet square, whose walls are of solid grouted masonry, so constructed as to be practically watertight. The deck is of ordinary flume construction, with a hole large enough to receive the largest wheels. Situated in the tailrace is a measuring weir, constructed according to the rules of James B. Francis, and from this the quantity of water used can be readily calculated. This weir is located far enough from the penstock that the water will become quiet before reaching it, and to more fully insure this the water is made to pass through racks which render the flow perfectly uniform.

When a wheel is to be tested, it is lowered into the penstock and placed in position there upon a false floor resting upon the deck, the false floor having a hole of a diameter to receive this particular wheel. The water wheel shaft is made of such a length that it can be coupled onto a shaft carrying a dynamometer. The dynamometer is a pony brake consisting of a cast iron pulley surrounded by a brass band, a stream of water circulating between them, a bent lever and weights weighing the power. When a test is to be made three men are stationed to record the various observations and an electric clock, ringing bells which may be heard by each one, insures that simultaneous observations shall be made. One of the observers notes the head on the wheel at the regular intervals, a second man records the depth of the tail water on the weir, and the third, located in a room above the testing flume, records the proportional gate opening, weight on the dynamometer lever and the revolutions of the wheel per minute.

In order that the head may be read directly at one observation the water from the penstock is conducted to a glass tube set in a recess in the wall of the tailrace and by the side of this glass tube is a wooden rod resting at the bottom on a disk which floats in the tail water. The rod is divided into feet and tenths, zero being the water line of the float, and as it rises and falls with the water in the wheel pit under the wheel, the head, that is, the height from the surface of the tail water to the surface of the head water, may be read directly upon it by observing the height of the meniscus of the water in the tube.

To measure the depth on the weir the water above the weir is conducted by a pipe into a watertight compartment in the side of the tailrace. The observer stands here and reads the depth by means of a hook gauge. The results of these various observations are recorded on a blank prepared for the purpose, and from the figures taken other columns are filled out. The following records are calculated from the observations taken, and are written on this sheet:

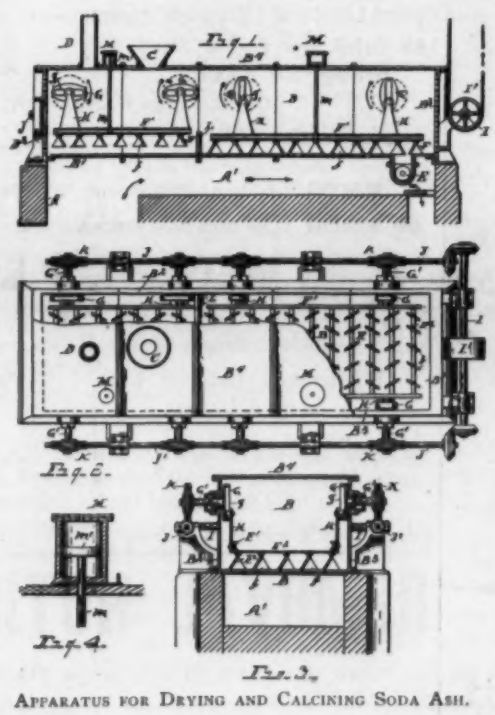
Quantity of water passing the weir in cubic feet per second calculated by weir formulas; quantity of water passing the wheel in cubic feet per second, obtained from the last by deducting the amount of all leakages; horse power developed by wheel under actual head calculated from the dynamometer and speed readings; efficiency of wheel in per cent; quantity of water discharged by wheel reduced to a uniform head; ratio of discharge of wheel to full gate discharge at maximum efficiency; ratio of velocity of perimeter of wheel to velocity due to head. From these figures curves are plotted on cross section paper showing the efficiency of the wheel at the various gate openings and the quantity of water consumed at each gate opening. The wheels are usually tested at five or six different openings of the speed gate, ranging from wide open to the opening at which the discharge is one-half that at full gate. At each of these openings of gate the wheel is tested at six or eight velocities of revolution. Wheels up to 210 horse power can be tested and at any head from 4 to 18 feet.

Apparatus for Drying, Roasting and Calcining Soda Ash.

An illustration is given of an improved apparatus for drying, roasting and calcining soda ash.

Figure 1 is a vertical longitudinal section of the apparatus. Fig. 2 is a plan view showing portions of the cover broken away, and Fig. 3 is a vertical cross section. Fig. 4 is an enlarged view of the cylinder M.

A represents any suitable furnace. The combustion chamber of the furnace may be located therein at the back or discharge end of the apparatus, or, as shown, the combustion chamber may be located under the front or feed end of the apparatus. The flues A' run underneath the drying chamber preferably the full length of the machine.



Apparatus for Drying and Calcining Soda Ash.

B is a drying chamber of any suitable construction, as with bottom plates B', side walls B^2, B^3 and a cover B^4. The bottom plates have any suitable engagement with the sides of the apparatus. Any suitable cover may be provided to prevent the escape of gas or dust.

C is the feeding duct or conduit through which bicarbonate of soda enters into the drying chamber, dropping upon the bottom plates of the drying chamber.

D is an exit orifice in the top of the drying chamber. E is a conveyor located toward the lower end of the chamber arranged to discharge the material.

The agitating mechanism to agitate the material to be calcined or dried consists of scrapers, F. These scrapers consist of the frame F', which may be made of angle iron, as shown in Fig. 3, to which are engaged crossbars, F^2, provided with scraper blades, *f*, suitably engaged therewith.

The drying chamber may be provided with any suitable number of scrapers, two frames being shown provided with the scraper blades. These scrapers are made reciprocatory in any suitable manner and by any suitable means, as, for example, by slotted cranks, G, each provided with an elongated slot, *g*, in which is engaged a connecting rod, H, engaged with the corresponding frame of the scraper. To operate the slotted cranks a driving shaft, I, provided with a driving pulley, I', is geared with longitudinal shafts, J, J', at the sides of the drying chamber. The arms G' of the slotted cranks are provided with a worm gear, K, meshing with the corresponding gear on the shafts, J, J'. It will be perceived, thus, that a reciprocatory movement will be given to the scrapers to carry or work the substance being treated rearward toward the conveyor.

L denotes a transverse upright plate extending across the drying chamber and up a desired height to allow a certain portion of the substance being treated to overflow the plate at each stroke of the scraper in the feed end of the chamber. The plate L serves to hold a thicker layer of moist material directly over the furnace and to prevent dust by keeping the body of the material being treated over the scraper blades. After passing over the transverse plate the material treated is traversed in a thinner layer to the opposite end of the machine, where it drops into the conveyor previously mentioned, which is arranged not only to deposit the material, but also at the same time to form a lute to prevent the gas from escaping. Any suitable number of exit orifices may be provided in the cover or sides of the drying chamber to take off the gas and dust.

The bars or arms F^2 to which the scraper blades are attached may have a rearward movement and are then lifted by the slotted cranks and returned for a successive forward movement. The slotted cranks can be made of any suitable shape and give either a greater or less traverse to the scraper blades. In order to regulate the fall of the scrapers they are connected to a dash pot or cylinder, M, as by a rod, *m*, provided with a piston, *m'*. The cylinder is provided with an air exit which may be provided with any suitable means for regulating the exit of air therethrough or instead thereof suitable springs may be employed, to prevent the scrapers from dropping, when lifted, to the bottom of the chamber. By making the worm gears equal the slotted cranks will work simultaneously the one with the other. In order to equalize the operation of the worm gears the number of slotted cranks is divided so that four of a set work together, being spaced so that when one of the arms is entering the material the other may be leaving it and a third set may be fully in the material.

Bailment—Innkeeper's Liability.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

Commercial houses and their traveling salesmen are especially interested in the above law title, as it regards the right of recovery for loss of money, wearing apparel, sample trunks, &c., while "on the road." It appears to be a peculiar and native institution of the English people, and at common law the innkeeper was answerable for all losses happening to the goods of travelers becoming his guests, except such losses as were caused by the act of God or the public enemy, or by the conduct of the guest himself or his servant, or the companion whom he brought with him, and he was answerable not only for their safe keeping, but for their well keeping, liable if they were injured as well as if they were stolen. To become subject to this extraordinary liability it is essential that the person should become a common innkeeper, should exercise the business of entertaining travelers or transient persons and become bound to receive all travelers demanding hospitality, unless there should be good excuse for refusing. While it is patent that advertising as such and putting up a sign will create the liability, these are not essential; a house may become such by practice of its keeper in receiving transients for hire, and exceptionally where it was done gratuitously.—(*Howth v. Franklin, 20 Tex., 802.*)

The abiding of the guest must be temporary, and not that of a regular boarder, but he does not become the latter by merely inquiring how much the rate would be for a week or month, nor if his wife lodges there permanently, he only occasionally at regular transient rates. It has been held that the landlord is liable where a guest sent his trunks, but himself stopped with a friend.

The liability of an innkeeper is for all the goods of a traveler intrusted to the care and keeping of the inn, and he is bound to take into his care and keeping the goods of all travelers coming to him as guests, without it being necessary that they shall be placed specially in his keeping. Thus where one gave his check to a transfer line, and told the clerk of the hotel to send his trunk to his room, and the trunk was delivered at the usual place at the hotel, but was stolen, the liability arose; and so where the guest left his goods after temporary residence and they were stolen during his absence of a few days, the landlord was liable; but if sent without prearrangement, no contract will be implied; or even after the guest has gone, except for gross negligence, as where they are given to an apparent stranger without inquiry as to right.

As has been said, at common law the liability extended to all goods brought to the inn, but this has been modified by statute and may be limited by notice that there is a safe in the office where valuables must be left. The statutes in such cases must be strictly complied with, and it has been held insufficient to have a notice printed at head of the "register," when the law required posting of a printed notice in rooms. The quantity and quality of goods which may be retained by a guest must depend upon circumstances, as one man might carry a "Waterbury" and another a "Jurgensen;" one might require hundreds of dollars, while another might get along with "fifteen dollars in his inside pocket," and it would not seem right that a Huntly or an Alvin Joslin should deposit their diamonds the moment they register.

The guest should use the best arrangements of the house, locking the door of his room when he goes out and shooting the bolt at night; failing in either of these he is guilty of contributory negligence, and it is no excuse, the court held once, that he was intoxicated at the time he retired. It is not negligence where he does not inform the porter that a valise contains valuables, although it might be well for him to explain at the time he deposits packages with the clerk. It being known that the goods were received at the inn and lost, the burden of proof is then on the landlord, and he must show affirmatively that it was without his fault.

It is perhaps necessary to add that the "house" being owner of the samples, &c., may bring suit, or the salesman in their name. The damages would be limited to the value of the goods, and loss of orders occasioned thereby would not be included.

The liability, it may be said in conclusion, calls for: (1) Greatest care of goods intrusted to the innkeeper and his representatives; (2) ordinary care as to sample trunks, extra baggage, &c., not in special custody of the landlord; (3) slight care where the goods are sent to him without notice or engagement of room, or left long after the departure of the guest.

The decisions on this subject are by no means numerous, despite the fact that there is more traveling in this country probably than in all Europe. It is to be presumed that one reason is that the amount is generally within the jurisdiction of a justice of the peace, and the case is seldom taken to the courts of record, and hardly ever goes to those of final resort, where the decisions are reported, and probably are not tried or appealed, because the guest must hasten on his journey and cannot linger or return for trial.

The general principles of these rules apply to sleeping cars, and the Pullman and other companies have been held liable for thefts by porters, &c.

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MIAMI VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, November 26, 1894.

A firm paper market and fair prospects are not to be sneered at by the trade, and they are not, for words of commendation and encouragement show forth the opinion of things as they exist. Allied trades are equally busy, and altogether the tendency is for gradual improvement.

One of the pleasantries of the past week came in the nature of a tally-ho ride to the George H. Friend Paper Mills at West Carrollton. The Daytonians composing the party were among the most prominent business men and manufacturers in the State. They were the guests of Col. J. K. McIntire, a wealthy wholesale merchant who is interested in the Weston Paper Company, at Greenfield, Ind. The following named gentlemen composed the party: W. P. Callahan, the millionaire owner of the Levis Paper Mill; Col. F. T. Huffman, proprietor of the *Times and News*, also interested in the Dayton Autographic Company and the Climax Tag Company; O. M. Gottschall, of the law firm of Gottschall & Brown; John W. Stoddard, of the Stoddard Manufacturing Company; F. E. Smith, of the Stilwell-Bierce and Smith-Vaile Company; Col. J. D. Platt, of the Barney & Smith Car Works; A. C. Marshall, of Cotterill, Fenner & Co.'s tobacco works; H. C. Lowe, of Lowe Brothers' paint manufactory; W. C. Mayer, of Mayer & Dille, drugs; J. P. Wolf, tobacconist; H. C. Groves, of Marshall & Groves, boiler manufacturers; N. Thacker, wholesale grocer; Chas. D. Mead, of the Mead Paper Company, Dayton and Chillicothe, and the host, Colonel McIntire.

A charming day added greatly to the pleasure of the ride. As soon as the genial coterie reached West Carrollton Howard Friend tendered them the freedom of the most extensive plant in the West, and a hospitable welcome which would have awakened warmth and good fellowship in the hearts of an imperial commission deputed by some potentate to inspect and report.

Mr. Friend invited them to a luncheon and divers accompaniments after the tour of inspection had been completed. Wit and repartee blended harmoniously, and the social session was not without a business complexion. Modern ideas of enterprising business men are always productive of much good, and it would be a rank disregard for the truth if such intimation was not referred to. The process of manufacturing the finest writing and printing papers out of pure wood was thoroughly examined. The at once surprising and remarkable revolution in the paper industry was a subject of general discussion. It seemed strangely queer to the representatives of the other concerns not allied to the paper trade to consider that Canadian spruce, which is shipped in carloads to West Carrollton and is piled in pyramids forming a solid wall about the various mills, could be so easily and quickly manufactured into finished paper. They were surprised to know that rags, the once convenient product for this line of manufacture, are used chiefly for the fancy grades of paper, and after watching the various processes marvelled at the result.

Few people, even in this immediate territory, are advised as to the magnitude of the combined Friend mills. They are gigantic, and those who pass the office and works on board a Big Four train are deceived by appearances. The entire population of West Carrollton is there employed. The town was recently incorporated, and only five months ago a building association was formed. That organization announces that $15,000 had been loaned on first mortgage, and that by the first of the year $30,000 will have thus passed hands, a remarkable statement from a village building and loan association. Thus is evidenced the material forerunner of a great era of progress and building construction. Mill workers desire to own their homes and within such proximity to Dayton appreciate the discretion of such a move. Sixty-five houses have been erected in West Carrollton during the past five years. The total value is $75,000. Thirty-eight of that number were constructed during the past two years, and prospects for an uninterrupted continuance are very bright. Undoubtedly the record is unsurpassed and shows to what extent an industry may aid a town. At such a rate of improvement other manufactories will find it convenient to locate there. After all West Carrollton is only a suburb of Dayton. Each year's growth of the latter city makes the claim more substantial.

The Ohio Screen Plate Company intends to locate in Hamilton. The new firm will give employment to a number of skilled workmen and the works will be in operation soon. To Black & Clawson, paper machinery manufacturers, is due the credit for this new and material addition to Hamilton's industries.

Ship canal enthusiasts have again met in this valley. The substance of the discussions showed that an additional appropriation of $80,000 is necessary, while it was the opinion that the time for the survey should be extended from March 4, 1895, to December, 1895. Resolutions to this effect were submitted and adopted, but what the result may be is, of course, unknown.

All of the mills in this and other cities and towns of the Miami Valley will close on Thanksgiving Day, to allow employees the pleasure of a few hours by the fireside. Many will pass the day at the football park and about the various places of amusement, while not a few paper makers will enjoy a day's hunt.

Paper manufacturers are just as well equipped to render thanks as any other commercial men. The past six months have brought affairs up surprisingly well, and throughout the year the clip has not been a bad one. There are several paper novelty firms in town which are ready to testify that the volume of business transacted during the year has been greater than preceding ones despite hard time and adversity croakers.

The *Daily Sentinel* died an ignominious death this week, the sheriff of the county being appointed receiver. The Weston Paper and Manufacturing Company's suit against the firm, styled the "People's Co-operative Company," to recover $141 on an account, compelled it to succumb. It is presumed the paper was started simply to boom J. W. Kronauge, a candidate for Congress. The assets were estimated at $600 or thereabouts.

Edward Friend, of the J. H. Friend Paper Company, has returned from a trip for his health in the North. He has been absent for several months, and has applied himself strictly to medicinal baths.

The Crume & Sefton Manufacturing Company added a quantity of new machinery to its plant recently. Several new cutters, presses and other machines required for use in that establishment have been placed in position. Orders have been coming in at a satisfactory rate, and altogether the hum of business is gratifying.

The Mead Paper Company has found its new office a much needed change from crowded quarters to spacious and well lighted rooms. It is handsomely furnished and the interior work is neatly unique.

It is now only a question of a short time until the Aull Brothers Paper Company will be enabled to remove its stock and manufactory from the present quarters on Second street to the new factory building on Fifth street, between Perry and Wilkinson streets. The building is strictly modern, and the change will prove very advantageous.

The conference of manufacturers for the purpose of a general interchange of views, looking to the formation of a National Association of Manufacturers, will be held in Cincinnati on January 22, 1895. It is desired that the convention shall be non-political, non-partisan and non-sectional. The invitations sent out are not limited as to number of attendants, but are cordially extended not only to accredited delegates from organized exchanges, representing manufacturing interests, but to any individual manager who may desire the promotion of the general good by organized efforts.

Paper manufacturers, show your metal! Give the Miami Valley a full representation!

M. V.

ADAMS.

[CORRESPONDENCE OF THE PAPER TRADE JOURNAL.]

ADAMS, Mass., November 24, 1894.

The L. L. Brown paper mill at Adams is running full time on its ledger paper specialties. It has just filled a heavy order for hot pressed hand made linen paper for Harper & Brothers, of New York, and has covered all of the requirements of that firm as to quality, weight and finish. Harper & Brothers will get out an illustrated holiday edition of "Trilby" on this beautiful stock. This company manufactures the only hand made paper in the United States; it has suffered severely during the past six months from low water, but although at this writing the supply is more plantiful, the great reservoir at Cheshire, on the south branch of the Hoosac River, was never known to be so low on the threshold of winter. This Adams mill is fully equipped for business, there being a steady demand for its products, with a decided tendency toward an increase in orders.

This company's mill at West Cummington is running full time on its all linen specialties and bond, for its make of which it is especially adapted, with a good staple demand for the same. A pleasing incident of late happening relating to the product of this mill has come to the knowledge of the company. Julia Bryant, of New York, daughter of the lamented poet, recently called upon her stationer in Paris and asked him for the best linen paper made, when he handed out to her the L. L. Brown Company's make produced upon her own native hills at West Cummington.

The L. L. Brown Paper Company has entered a three count suit in the Superior Court of Berkshire County against L. L. Brown and trustees for a nominal sum, to which the defendants have filed a demurrer that "no bill of particulars has been given in the first two counts," and that in the third count "an action of contract is joined with an action in tort." Both parties have for several months had experts looking over the company's books in their separate interest for a period covering twenty years, and this action is thought to have been brought to cover some disputed legal points and to bring on a settlement between the parties without recourse to jury trial. It is understood that with the adjustment of this matter, which grew out of the financial difficulties in other ventures of the head of this house, all of his perplexing affairs will have been honestly and honorably adjudicated.

George F. Barden, of the L. L. Brown Company, has gone to Delaware Water Gap Sanitarium, in Monroe County, for eight weeks for needed rest and treatment for a second severe attack of nervous prostration. Several years ago he was similarly attacked, and obtained complete relief at this sanitarium. His late attack was while returning from a Southern trip, and although he is very much better by a short lay off at Delaware Gap he hopes for entire and speedy recovery, which will enable him to resume his duties.

The Hurlbut Stationery Company was organized in Pittsfield in 1893, since which time it has been running full time with a large force of hands. Its specialties are high grade and society stationery of all kinds, and for the past two months it has been so crowded with orders that it has added many employees, and has been obliged to double its clerical force. The plant is centrally located in a four story brick mill, 50x150 feet, with an annex 30x110 feet, with outbuildings. Its shipping facilities are first-class, and it markets its product all over the country. It is run with a 50 horse power engine, and furnishes its own dynamo for electric light. It is thoroughly equipped with the machinery calculated to make a modern stationery plant successful, and is a veritable beehive of industry. It is connected with the Hurlbut Paper Manufacturing Company's mill at South Lee by telegraph and telephone.

The W. W. Whiting Company, manufacturer of fine stationery, on West street, Pittsfield, is the pioneer firm in this business in central Berkshire. It occupies spacious quarters in the Gamwell Block on Columbus avenue, and handles only reliable staple goods, with a steady and growing trade, principally in the Eastern portion of Massachusetts.

Ex-Gov. Byron Weston, of Dalton, has gone South to reside during the winter, as has been his custom for several years, his health not permitting an attempt to weather the rough Berkshire atmospheric changes during the coming five months.

W. H. P.

HOLYOKE.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., November 29, 1894.

Trade has not shown any very particular change since last week, but all indications continue to be favorable. The movement of paper seems to be quite evenly distributed among the various grades, therefore none of the manufacturers have any special cause for complaint.

The present week has been broken, as this is Thanksgiving Day and many of the mills are idle in consequence. The help who have home and friends elsewhere have gone away to spend their holiday.

Some of the mills which manufacture specialties for holiday goods have had a far better business this year than last, which shows that the people are gradually recovering from the business depression of the past year or more.

The stock dealers say that their business has not changed much this week. The demand for both foreign and domestic rags is somewhat ahead of former weeks, although it is not what it ought to be. The mills are carrying fair sized stocks, but not as large as they carried two years ago at this time. Prices are firm and changes are not quoted to any extent.

So it seems that the Purcell Envelope Company, which recently came to this city from Albany, will leave us by the first of the month and re-locate at Hartford. Its stay here was of so short duration that we shall hardly miss it. One thing I can say, however, from personal experience. We shall not be sorry to have a certain element of the male help which came here with the company quit the city, for some of these people were about as undesirable a class of citizens as it has been my fortune to run across for some time.

The company has very nearly finished its arrangements for departure. Some of the help hired here have been discharged, and the stock of envelopes already manufactured, amounting to about 50,000, will be shipped to Hartford, where the business of manufacturing will be resumed without interruption.

What the arrangements are as regards the plant here, I cannot say, but it is understood that the new building will be utilized and the machines run on commercial envelopes. The full number of machines contracted for has never been received here.

Mr. Powers seems to be satisfied with the new arrangement, because, under the terms of his contract, he will furnish the paper for the envelopes for the next four years.

The report of the business done by the post offices in this section of the State shows that the gross receipts at the local office last year amounted to $45,141. In 1893 they were $48,172 and in 1892 $41,776. This was a shrinkage of business last year of $3,000 over the previous year and affords some idea how the business depression affected the sale of postage stamps. Springfield's decrease during the same period was less than $2,000.

The Hampshire Paper Company has been needing more room in its stock house for some time, and in order to meet the demand another story has been added to that building.

George E. Dudley, of the Syms & Dudley Paper Company, who has made his home here since the company removed to Water-

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vliet, Mich., left for his new abiding place this week. George will be sadly missed by those interested in good horses.

E. N. White, of Smith & White, has returned from an Eastern business trip just in season to put the finishing touches on his campaign for the aldermanic board.

H. F. Morrill, formerly interested in the American Pad and Paper Company, has just bought a silver and nickel plating works and has engaged in that business. H.

BOSTON.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
67 FEDERAL STREET,
BOSTON, November 28, 1894.

Concerning business itself in paper trade circles, little of general interest comes to notice this week.

This being Thanksgiving week, the public mind runs more to the festivities of the morrow than to those matters which command its usual attention when not concerned in providing for festive occasions.

As to-morrow, Thursday, is the day for thanksgiving, and really feeling thanks cannot be given without "turkey and fixin's," a great many are chasing around to-day looking for a copy of the festive bird.

The married employees of Carter, Rice & Co., of the A. Storrs & Bement Company, of Train, Smith & Co. and possibly those of other city firms, will eat turkeys presented to them by their employers, as is the custom of those firms.

J. C. De Coster and Frank Tufts, of the Poland Paper Company, leave town to-night for New York, where they will carve their Thanksgiving Day turkey.

Charles D. Brown is doing Maine at present, but will return in time to eat turkey with his son, Charles A., at his home in Salem.

News was received here yesterday of the death of Charles S. Kendall, vice-president of the Rice-Kendall Company, he having died Tuesday at Augusta, Ga., where he went some few weeks ago for his health. His funeral will take place Friday at 1:30 P. M., from the Clarenden Street Baptist Church.

At noon to-day quite a number of the leading members of the city trade assembled at the Federal street office of Train, Smith & Co. to take action on the death of Mr. Kendall.

The following preamble and resolution were passed:

"*Whereas*, An all-wise Providence has removed from our midst Charles S. Kendall, one with whom the Boston paper trade have been closely allied and associated for forty years; that in his death the trade have suffered an almost irreparable loss, and that they have had taken from them a man of sterling honor, integrity and worth;

"*Resolved*, That, appreciating fully his high character and his genial, manly qualities, we tender to his grief stricken family our heartfelt sympathy."

The following named committee was appointed on behalf of the trade to attend the funeral ceremonies: Hon. Wm. A. Russell, Amor L. Hollingsworth, W. T. Barker, Charles D. Brown, Col. E. H. Haskell and Col. S. P. Train.

Trade representatives seen in town since Thursday last were: A. C. Moore and F. W. Flint, of Bellows Falls, Vt.; Oscar Hartwell, of Nashua, N. H.; ex-Governor Cheney, of Manchester, N. H.; James Wallace, of Westfield, Mass.; Fred Temple, of Pepperell, Mass.; Chas. S. Mayo, Ed. Barton and Geo. W. Severance, of Lawrence, Mass.; Oscar Dikeman, of Lee, Mass.; J. F. McElwain, of Holyoke, Mass.; Mr. Williams, of Worcester, Mass.; D. B. Rising, of Mittineaque, Mass.; W. N. Smith, of Manchester, Conn.; Joseph Philbrick, of North Dighton, Mass.; H. A. Emerson, of Henniker, N. H.; M. L. Bassett, of Lowell, Mass.; C. A. Whedon and Leon Gottheil, of New York.

E. S. Taylor, of Bigelow & Taylor, is confined to his home, sick.

The meeting of the Boston Paper Trade Association to be held at the Hotel Brunswick next Wednesday evening, September 5, promises to be a red letter event. As J. Richard Carter, president of the association, will be on his way South at that time the Hon. Wellington Smith, of Lee, Mass., will preside and guide the festivities of the evening. Col. A. G. Paine, of New York, president of the American Paper Manufacturers' Association, and George C. Sherman, its secretary, will be guests on this occasion. C. Milton Chase will entertain the meeting with problems in magic, sleight of hand and optical illusions; James W. McCabe, a humoristic specialist, has been engaged to delight all present. This artist was secured by the coachers of the Harvard football team to go to Springfield last week to keep the team in good cheer, and it is said that the loss of the game was the result of his jokes and humorous stories—the players injured themselves internally, laughing at his gags, the evening before the game. Songs, solos, duets, &c., will be rendered by the Boston Singers' Quartette, and Henry's Orchestra will furnish the instrumental music. It is possible that other attractions not on the bill will be presented, as the secretary is looking for a professional skirt dancer, and every member laying claim to artistic abilities will be permitted to "take a turn" in the programme. If such an entertainment does not crowd the banquet hall of the Brunswick next Wednesday evening the committee says that it will arrange for a lecture on the art of making paper.

Speaking of making paper calls to mind the fact that Arthur D. Little, the noted paper mill chemist, of this city, and author of the "Chemistry of Paper Making," delivered last week before the Society of Arts, at its meeting at the Institute of Technology, an address on the subject of "Paper Making and the New Uses of Wood Pulp."

N. H. Furness, formerly of New York, but for some months past living in this city, returned last week to the metropolis, where old friends will no doubt be pleased to welcome him again.

James Logan, of the Logan, Swift & Brigham Envelope Company, Worcester, Mass., who left for Europe some weeks ago, cables Boston friends from Glasgow that he arrived there safely, and that his wife and boy are in good health.

DELESDERNIER.

NORTHERN NEW YORK.

[FROM OUR REGULAR CORRESPONDENT.]

WATERTOWN, N. Y., November 29, 1894.

A number of improvements are projected in this section. The Outterson Paper Company, Brownville, has found its present capacity inadequate, and plans have been perfected to add a new machine room and put in another machine. This work will begin in the spring. It will be of stone 50x120 feet. The company has arranged to have the material quarried and hauled during the winter, while sledding is good, which will be a cheaper mode of transportation. The new machine will be 84 inches wide. The material is being got together for the equipment of the new plant. Workmen have begun the shaft for the wheel pit and will push forward the work through the winter.

The Harmon Machine Company is busy repairing some of the grinders of the Gouverneur Wood Pulp Company's mill at Emeryville, and is also doing a large share of the repair work of the mills along the Black River. The company has increased its force and is working overtime.

Another big talc mill is to be built near Carthage. A syndicate represented by Henry F. Selleck has leased Tannery Island, on which is the old mill, which has long been idle. The new syndicate, which is composed of New York men, will put in a large amount of machinery for grinding the talc. The capacity will be 100 tons a day. It is designed to bring the talc from the Graves Mine, near Natural Bridge. If the plans of the syndicate do not miscarry the plant will probably be enlarged immediately. W. E. T.

WESTERN NEW YORK.

[FROM OUR REGULAR CORRESPONDENT.]

NIAGARA FALLS, N. Y., November 27, 1894.

An uncalled for statement was published in a local paper the other day which on its face was a very serious matter for the Niagara Falls Paper Company. It was to the effect that the company had cut the wages of its employees 25 per cent. This was shown to Mr. Morgan by THE PAPER TRADE JOURNAL correspondent, and a prompt denial was the result.

"There is not a word of truth in the article," said Mr. Morgan. "We have made no reduction of 25 per cent. in the wages of our employees. Out of the 238 employees on the pay rolls of the company, I know of no more than one man who in the last month has had his wages reduced, and that only nominally. The statement is not calculated to do the city any good. I hardly think it can injure our company any."

A party of prominent Pennsylvanians visited the paper and pulp mills here on Wednesday and were greatly impressed with the great industries of this city. There were bankers, capitalists and manufacturers from all over Pennsylvania, and some from New Jersey. They traveled in special Pullman cars on the Lehigh Valley Railroad. A banquet was given them at the Hotel Kaltenbach and a theatre party in Buffalo. They were entertained by a local syndicate of real estate agents.

W. E. T.

FOX RIVER VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., November 27, 1894.

Your correspondent noted last week that some of the manufacturers were expressing themselves as not so sure now that the syndicate deal would go through, but it was also intimated that there had been no news which warranted such an idea. It now becomes his duty and privilege to state that just now there seems to be more stable ground than ever for predicting that the proposed sale will be consummated. Your Chicago correspondent last week also noted that the feeling in that city was that the operations of the syndicate were practically at an end. Although your representative here has been very careful not to commit himself to any opinion as to the outcome of the negotiations, he feels now almost like risking the statement of a conviction that the thing will be a go. Mr. Butterworth arrived in Appleton last Sunday night, and talked more freely than he has ever done, seeming to feel that he had much firmer ground to stand upon than formerly. His demeanor has undergone a great change, and he seems now to be willing to speak, as the result of something which has given him added confidence. Several weeks ago the exclusive announcement was made in these columns that it was probable that a portion of the capital necessary for the enterprise would be subscribed in this country, instead of all of it being taken abroad. It is now certain that this is the case, and Mr. Butterworth's long visit to New York, from which he has just returned, was made for the purpose of reporting there his progress and closing up the American end of the transaction. Mr. Butterworth makes no secret of the fact that a large portion of the capital will be found in New York—in fact that it is already found and waiting. It is understood that this portion may not be less than one-half of the whole amount, and, in confidence, Mr. Butterworth mentions names in connection with the affair which represent almost unlimited wealth, and whose investments are constant.

His present visit here is made for the purpose of closing up some details which need his attention. He is making arrangements for having photographs taken of all of the mills, and also for putting at work a large number of draughtsmen in preparing complete plans of the mills which are proposed to be included in the syndicate property. This will take only a few days. He said to your correspondent that he had engaged passage, and expected to leave New York for London two weeks from to-morrow, and expected to have no difficulty in arranging for the remainder of the capital to be taken abroad. He has a calmly confident bearing, which augurs his own belief in the success of his approaching mission.

A car loaded with sulphite fibre from the mill of the Riverside Fibre Company, in this city, was the cause of a bad accident on the St. Paul Railroad in this city yesterday. It was attached to an accommodation train and had just crossed the bridge over the river leading to the mills of the Atlas Paper Company, when one set of trucks of the car jumped a frog and started off on a sidetrack. The result was that before the train could be stopped several of the cars were ditched in front of the paper mills, and considerably broken up. A brakeman thrust his hand through a window and cut his wrist on the glass, and an old lady in the following passenger coach was thrown onto the seat in front and somewhat injured.

A very peculiar accident is reported in the papers to-day as happening to a car of paper en route on the railroad near Waukesha, in this State. The car was found to be on fire and was a total loss. The funny thing is that it is stated that the cause of the fire is thought to have been from the rubbing together of the bundles of paper.

Work is under way at the mills of the Kimberly & Clark Company, at Kimberly, in preparation for the receipt of the new steam engine which has been ordered for that establishment, notice of which was made in these columns a couple of weeks ago. The foundations for the engine are being laid and the engine room is being put in readiness for use. The engine is expected to arrive about the 20th of next month. Most of the manufacturers have, of late, been rather chary of putting in new machinery until it should be definitely known whether or not the syndicate was to take possession of everything next spring. The Kimberly & Clark Company, however, evidently believes in having what it needs without reference to any such consideration.

The Appleton Woolen Mills seem to be gaining the confidence of the Eastern manufacturers, judging from the number of duplicate orders which they report receiving for their new jackets as well as fine felts. They have also recently filled many large orders for pulp felts of their manufacture.

Several months ago your correspondent reported a brutal assault which had been made in the night upon Mrs. Sherman, of Neenah, wife of a man employed in the mill of the Gilbert Paper Company. Yesterday a sixteen year old lad was arrested for the offense and made a full confession. He was going home at midnight, and, disliking the woman for some cause, he climbed through a window and struck her on the head with a billet of wood.

The trial of the alleged aldermanic boodlers of Kaukauna, in connection with the inter-urban electric road franchise, has been in progress for a week and has made a great sensation. The trial was concluded last night and the judgment of the court is awaited with much interest.

Superintendent Wagg, of the Kaukauna Paper Company, has resigned his position and returned to his former home at Ticonderoga.

F. J. McGovern, the well-known felt man, has been in town this week. He says that wherever he has been of late he sees the revival of business which has been reported to be so apparent here.

J. Fred Ackerman, of Perkins, Goodwin & Co., New York, was in town for several days last week calling upon many friends in this valley.

W. L. Becker and W. G. Chappell, of St. Louis, left for home this morning after looking over the mills and the condition of trade here for several days.

Jos. Thomas, of the Pulp Wood Supply Company, has departed on a visit to the northern woods in the company's interest.

FOX RIVER.

Emeline R. Bishop, wife of James H. Bishop, of the late wholesale paper house of James H. Bishop & Co., Minneapolis, Minn., has served papers in a suit for $20,000 damages against Theo. E. Rice, Chas. F. Smith and J. H. Williamson, members of the paper house of Bradner Smith & Co., Chicago, Ill., for alleged mismanagement of the affairs of James H. Bishop & Co. in which firm they were stockholders and of which Williamson was manager. The complaint charges that a receivership was forced when the firm was wholly solvent, and that the defendants were instigators in a suit now pending in which the receiver, B. F. Nelson, is plaintiff and J. H. Bishop defendant.

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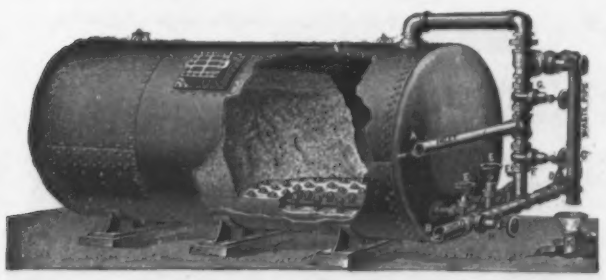

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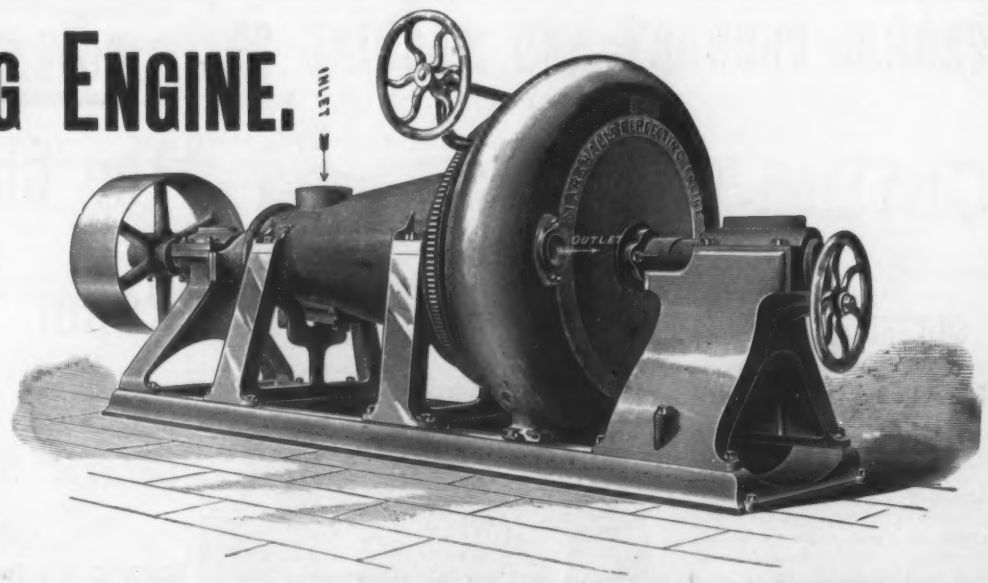

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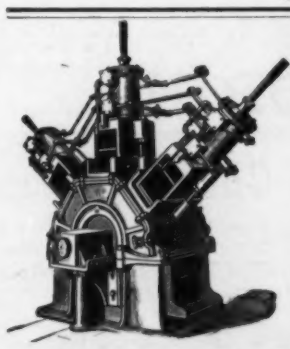
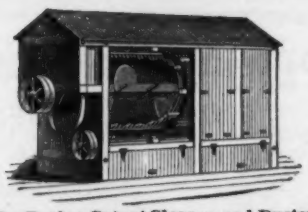
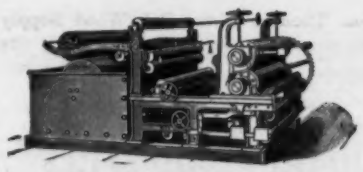
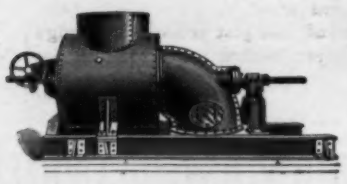




The Taylor Patent Cleaner and Duster.





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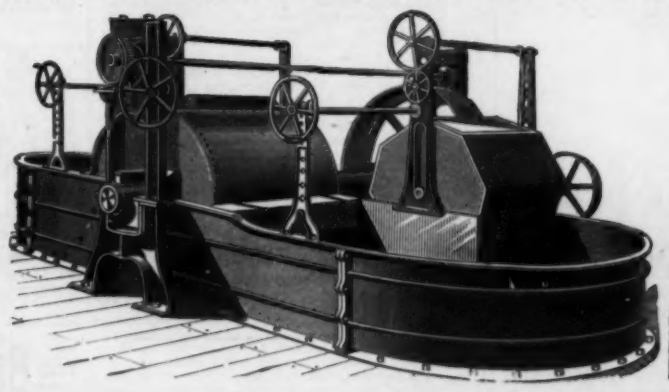

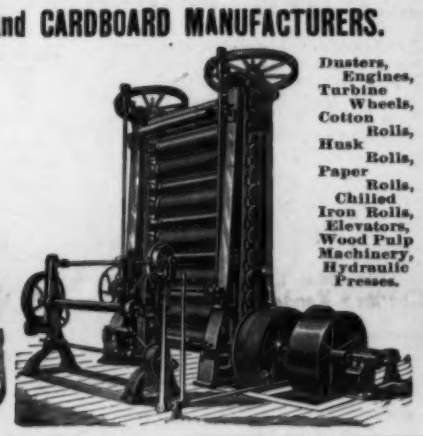

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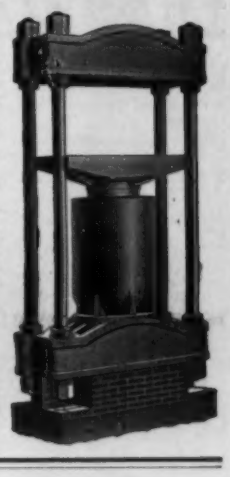
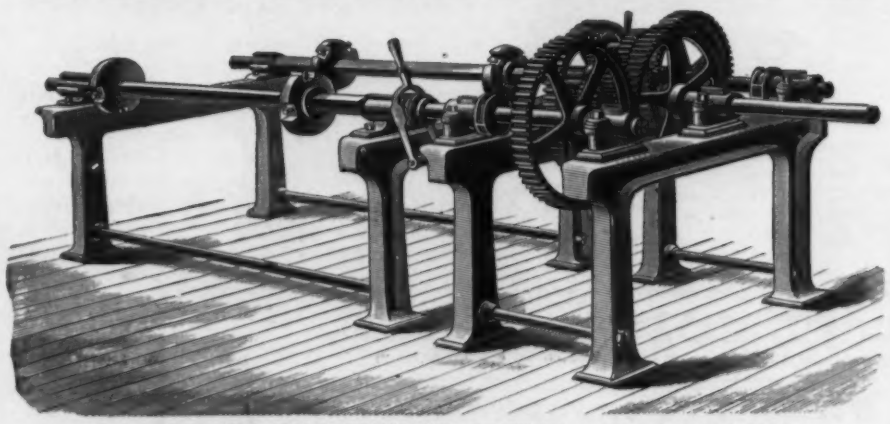


THE BAGLEY & SEWALL CO.,

Watertown, N. Y.



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WHEN YOU WANT ANYTHING IN OUR LINE WRITE US BEFORE ORDERING ELSEWHERE.

DO NOT FORGET

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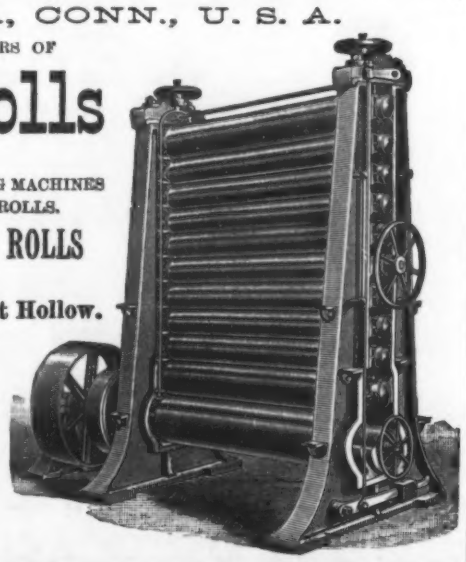

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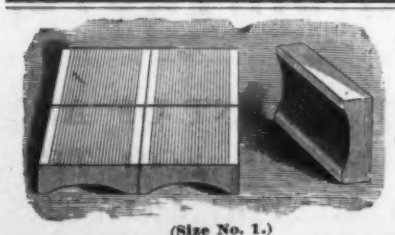

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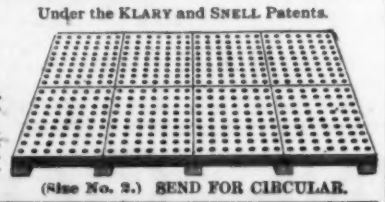

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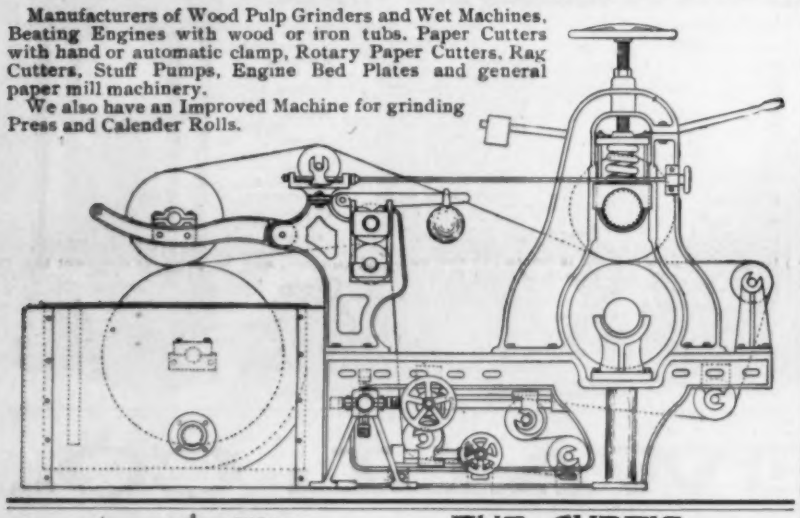

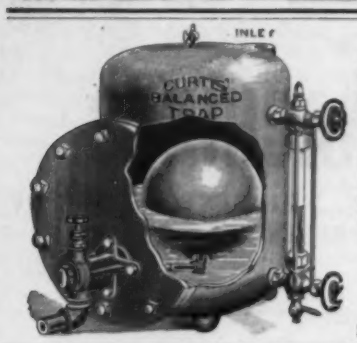

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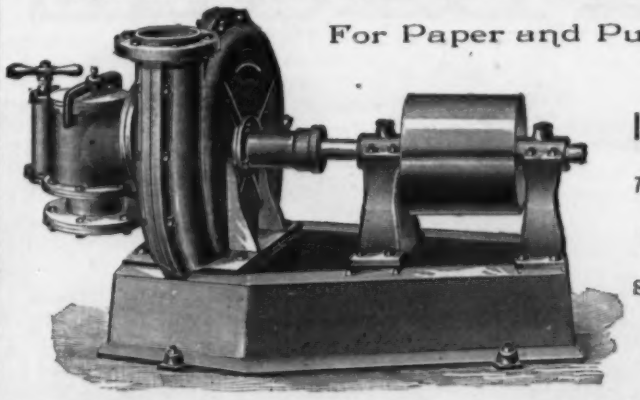

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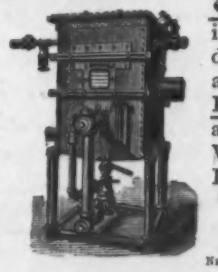

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Rope Power Transmission.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By W. H. Weston.

Rope power transmission is fast coming into general use, and the extent to which it is run at the present time is good proof of its availability. The advance in the way of improved details has been the substitution of the V groove in place of the semicircular one, and in the American or single rope drive in place of the old method of using a number of separate ropes to transmit the power of a drive.

The kind of rope usually employed is manilla, although a cotton rope has better wearing qualities; but the greater cost of the cotton rope gives the manilla the preference. In the manufacture of such rope the fibres should always be long and as uniform in size and quality as it is possible to secure; while the most careful and thorough methods and workmanship should be employed in its production, it being plain that only the very best rope should be bought for the purpose of a power drive. As there is so much rope of an inferior quality to be found, it is of great importance to take such precautions in purchasing as will insure an article of the highest grade obtainable. For a large plant it is usually best to have the rope made to specifications and under inspection.

The Government tests of a lot of manilla rope show an ultimate tensile strength of about 9,000 pounds for rope 1 inch in diameter and about 12,000 pounds for rope of 1¼ inch diameter, these being the sizes commonly employed in the American system of drives. In some of the old arrangements larger sizes are used. The tensile strengths given are probably a fair average of what should be figured on for a rope drive, the total load on the rope of a drive being 4 or 5 per cent. of the tensile strength for good results, and the tension on the rope from the load of the tightener or guide wheels and from centrifugal force being included in this percentage.

The speed in lineal feet per minute at which ropes are run varies from 3,000 to 5,000 feet usually. Everything considered, it is the best practice to employ a speed of about 4,000 feet per minute. There is no economy in running a rope drive at a low speed, because it takes so many more turns of rope around the wheels to keep the strain on each one down to the proper figure; otherwise the rope must be of such a size that it will be a great disadvantage, clumsy to handle, the most serious matter about it being the fact that a large rope not having anywhere near the flexibility of a small one it will not run over anything except wheels of very large diameter, and even on those it does not set in to its work so readily and so well as the small rope. Another thing is that it being the custom at present to run most shafting at high speed, a corresponding lineal speed in the rope is an advantage.

The lineal speed of a rope cannot be increased beyond 5,000 feet without entailing excessive wear upon it, and as the speed increases the centrifugal strain on the rope rapidly increases. Of course at a given strain on a rope the higher the lineal speed the greater the amount of power transmitted, not counting the two elements just mentioned; but these set a limit for power purposes.

As to the length of time that a rope will last in a drive running continuously ten hours a day, there is not at the present time sufficient experience to warrant a positive conclusion. The variation in the quality of the ropes in different places and the different conditions under which they are run give such varying results that it is considerable of a problem to average them up. In many places where they have been running for three or four years they appear to be in as good condition as when first put into use, and while I have heard of ropes which were said to have run for twelve or fifteen years in good condition, I do not know that it is safe now to conclude that ordinary ropes will run continuously for this length of time in the best of condition, although future experience may prove it. I have no doubt that a well made cotton rope will run fifteen or eighteen years in good condition and possibly longer.

As to the size of wheels over which to use a rope, it is the best practice not to put the rope over a wheel of less than fifty times the diameter of the rope, and unless absolutely unavoidable one less than fifty diameters should never be used in any part of a rope drive. The material of which the wheels are made is cast iron, this being as good a material as can be employed, as it is of low cost and gives good adhesion with the rope. The accurate formation of the grooves is the most expensive part of the wheel construction, as the grooves in all wheels should be turned, and the wheels should never be used as they come from the molds. The grooves should always be V shaped, and of 40° to 45°, this form giving the best hold on the rope, because the more the load the tighter the rope will draw down into the groove and the greater then will be the adhesion. With the old form of semicircular groove the rope rested directly on the bottom with much more chance of slipping under a load, and far less adhesion with a given size of rope than would be had with V grooves. Semicircular grooves soon become worn to a high polish, rendering slipping easy.

The most common method of greasing a rope is to apply tallow alone or mixed with graphite at intervals during its use. In some instances this is applied during the manufacture of the rope, which is undoubtedly the best practice. The application at the time of making distributes the tallow and graphite completely through the fibres and strands clear to the centre of the rope, thus making it much more flexible to start with. This treatment of grease also keeps out water and dampness to which a rope may sometimes be subjected, and tends to counteract the drying effects of a heated space through which a drive very often has to run continually. The amount of tallow applied should not be enough to make the rope at all slimy, but simply enough to render it moist and flexible. This must be controlled by circumstances.

It is of course obvious that the American system of drive is far preferable to the old or foreign method. The latter employs a number of separate ropes; that is, where there were, say, ten grooves in the wheels, ten separate ropes would be used. There are very serious disadvantages to this; there are ten separate splices, each of which is a disadvantage, and it is impossible to keep them so that the length of each rope will be such as to give a uniform tension in each of the ten; therefore some of the ropes will be doing their part of the work, while others will only be taking a partial load, and the care and time of taking up ten splices is serious work; even then the results are not satisfactory, as stated.

In the American system one long, continuous rope is used, and consequently there is only one splice, while the number of grooves in which the rope passes can be as great as desired. The grooves being cut in the wheels as usual, the rope, starting from the first groove in one wheel, goes to the corresponding one in the other wheel, and then back to the second groove of the first wheel, &c.; so that when the rope leaves the last groove of the second wheel the tightener wheel, being set at an angle, guides it back to the first groove of the first wheel. The tension arrangement should be composed of three wheels, one in the plane of the last groove of the second wheel, one in the plane of the first groove of the first wheel and the intermediate one set at an angle between the other two, so as to take the rope from one and deliver it to the other, the intermediate wheel being elevated above the others, set in guides and properly weighted to give the required tension to the rope.

The splice in a driving rope should be eight or ten times the length of an ordinary splice used in cordage, and the diameter of the rope at the splice should not be materially increased.

Legal Decisions.

[SPECIALLY REPORTED FOR THE PAPER TRADE JOURNAL.]

When Title to Checks Deposited Passes to Bank.—Upon a deposit being made by a customer of a bank, in the ordinary course of business, of checks, drafts or other negotiable paper, received and credited to his account as money, the title to the checks, drafts or other paper immediately becomes the property of the bank unless a different understanding affirmatively appears. An indorsement by the customer of a check payable to his own order, "for deposit in (name of the bank) to the credit of (the name of the depositor)," is sufficient to pass the title to the check to the bank, and is not a restrictive or qualified indorsement.—*Security Bank of Minnesota v. Northwestern Fuel Company* (*Supreme Court of Minnesota*). *59 N. W. Rep. 987* (*111*).

Liability of Employee.—An employee in working around dangerous machinery must notice. His faculties and senses are given him for the purpose of self preservation, and he must exercise them to a reasonable extent; the law is well settled that an employee when he assumes his employment, takes the risk of all apparent danger, and is the doctrine of common justice and right between employer and employee, and the doctrine of common sense. When an employee in a saw mill crushed his finger in a cog wheel which was unprotected, and the view of it was somewhat obstructed from where he usually worked, but if he had looked he could have seen it at any time when the mill was clear of lumber, he could not recover.—*Olson v. McMurray Cedar Lumber Company* (*Supreme Court of Washington*), *37 Pac. Rep. 679* (*126*).

Testing Lubricating Oils.—II.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By James F. Hobart.

The next step is to test the viscosity of the oil. A very old and "rule of thumb" method of doing this was to place a drop of each oil to be tested on one edge of a pane of glass, Figure 6, then elevate that edge of the glass and let the oil run a race across it. The oil with the least viscosity got ahead the fastest, and the experimenter claimed that the oil which went the furthest was the

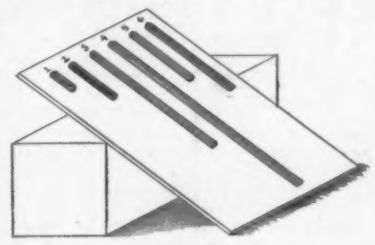


Fig. 6.

best. This test needs a good deal of modifying, for if a drop of sperm and a drop of cylinder oil were thus started in a foot race, it is evident that the sperm would soon be way ahead of the cylinder; but who shall say that the lard oil is the best? Imagine such a trial of speed between dope and indicator, or watch oil!

A little device for testing viscosity is shown by Fig. 8. This machine may be made of tin—an old tomato can or two and some tin scraps can be made to answer, or a quite elaborate concern can be made up for permanent use. Two or three thermometers ought to be provided, and they should be of the all glass kind, like Fig. 7, with the graduations marked in the glass, *not* mounted on a tin case as in common instruments.

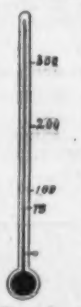


Fig. 7.

The viscosity tester shown in Fig. 8 consists of the outer and inner shells forming the water jacket *f*, which is supplied with steam from the tube *c*. A vent, *l*, serves to carry off the vapor, &c. A thermometer, *a*, is inserted, so that the temperature of the water jacket may be determined at will. The inner vessel contains the oil to be tested. The wire *g* serves to lift the gate *k*, and another thermometer, *b*, tells at what degree the test is being made.

In operation, the machine is filled with water up to the dotted line *i*. This requires 240 cc. of liquid. The gate *k* is then raised, and (with the thermometer *b* reaching 60°) the water is allowed to run through the tube *c* into the graduate *k*. A close watch is kept, and the flow of water is stopped at the instant a given quantity, say 200 cc., has escaped, and the time is accurately noted. The number of seconds thus occupied forms a constant for this device which should be marked upon it.

To measure the viscosity of any oil: The tank is filled up to the mark *i* (240 cm.) and the temperature is raised to the required

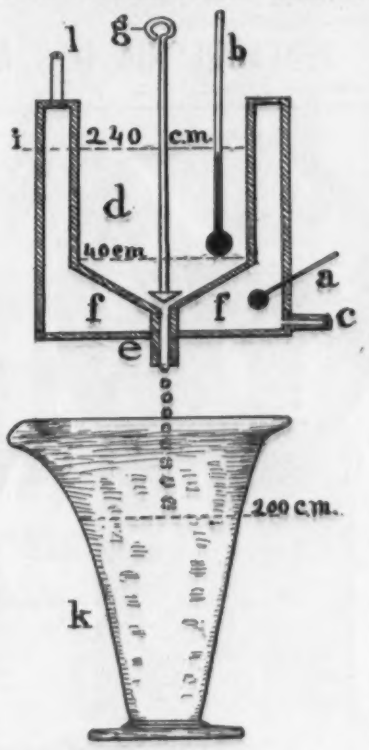


Fig. 8.

degree by steam forced in through the tube *c*, and noted by the thermometers *a* and *b*, then the plug *k* is raised and either 200 cms. of oil are allowed to run out, and the time is noted; or what is quicker, oil is allowed to flow for a length of time equal to that occupied by the exit of the 200 cms. of water. In the first case, the time in seconds, divided by the time required for the running of the same volume of water, gives the specific viscosity, or "viscosity grade."

If the water required 100 seconds and the air 300 the viscosity would be marked 3, &c. By the second method, the water required 100 seconds, and in 100 seconds of oil flow 66.66 centimetres of oil came down. Calling water 1,000 the oil coefficient of viscosity becomes 5 × 66.66 = 333.30. This style of rating viscosity brings it upon the same plane as that of specific gravity—makes things a little nicer, that's all.

The viscosity of oils can be relatively compared at the degree of heat under which they must work in practice. Thereby the behavior of cylinder oils can be noted up to 212°. If it is desired to test higher than that some other method of heating must be employed, or the tanks must be made of sufficient thickness to stand steam pressure. By filling the outer tank with some refrigerating mixture, say with brine cooled down to 10° or 12° by ice and salt, the viscosity of oils for water use may be ascertained.

The next step is to learn the flashing point of the oil sample. Some oils may be dangerous to approach with a light when wound up, or a cylinder oil may be vaporized by a degree of heat much less than is encountered in the engine steam chest. The same instrument (Fig. 8), modified as shown by Fig. 9, may be used for ascertain-

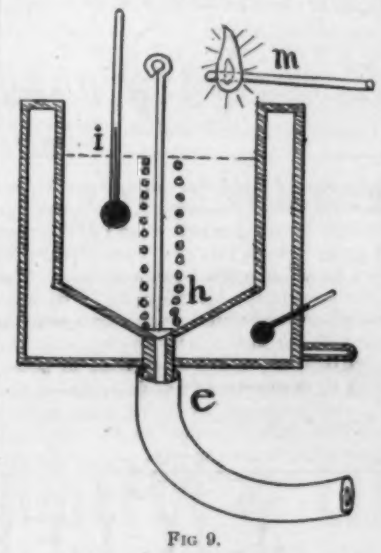


Fig 9.

ing the flashing point of any oil. The graduate is removed from underneath *e*, and a rubber tube is attached and carried to an air pump or the bellows of a smith's forge. When the oil is heated to the suspected temperature, air is forced in at *e*, raising the plug *h*, and bubbling up through the oil. A lighted match or candle at *m* ignites the oil vapor as it rises. In this manner it may be readily determined whether a given cylinder oil will stand steam temperature without being dispersed in vapor, leaving the engine surfaces without proper lubrication. Illuminating oil may also be tested, and the flashing point determined with considerable accuracy.

Another step to investigate is the freezing point, or mitting point, or degree at which the oil congeals, or at which paraffine separates from some petroleum oils. This may be done in a very simple manner by putting one of the thermometers through a tight fitting hole in a cork and inserting the cork in a test tube in which some of the oil has been placed. There should be some space between the oil and cork, to allow of shaking the oil when necessary. The tube is then packed in ice and salt, Fig. 10, and removed and shaken occasionally as the temperature drops.

There are two ways of arriving at the determination of freezing points: One, the American test, is to melt the oil or paraffine, then suspend the bulb of the thermometer three-fourths in the oil and one-fourth in the air; note the temperature at the instant filming across the top of the oil first appears. The English test is to stir the oil as it cools with a thermometer until congealing begins. At that point the mercury will remain stationary for a short time, as the crystallization of the material produces enough heat to arrest the cooling as noted. The results of this test are said to be from 2½° to 3° lower than those furnished by the American test.

Of the mechanical tests only one remains, but that is the most important of all. It is the test for coefficient of friction, and must be made in a machine more or less costly. Professor Thurston has invented a machine for this purpose (described previously in The Paper Trade Journal), in which both the resistance in the speed of revolution of a rotating axis, due to friction, and the heating of the axis and the bearing in which it rotates are measured. Space cannot be taken in this article for a description of Thurston's oil tester, but in a future article cuts and descriptions of a "home made" oil tester may be given.

Before discussing the chemical tests which an engineer may easily use, there are a few half chemical, half mechanical things which may be done. For instance: pure lard oil has no effect upon brass or other alloys, and in an oil cup will not corrode the metal. Frequently lard and other oils are adulterated with cotton seed oil. When this is the case the oil cups are quickly attacked, and soon become badly corroded and covered with verdigris.

Before petroleum oils were used tallow was in great demand for cylinder lubrication, notwithstanding the fact that it exerted a corrosive effect upon the walls of the cylinder steam surface; this effect was due to the presence of an acid in the tallow. Really there are three acids in tallow and other suet fats—palmetic, oleic and stearic, the latter being the one which causes trouble. Stearic acid can be obtained from animal fats by treating them with alcohol, from which the acid crystallizes in brilliant leaflets which melt at 69°.

Cotton seed oil is largely used in adulterating mineral oils, and chemical experiment readily detects its presence. This oil is employed for adulterative purposes because it is easily thickened by blowing air through the heated oil. This causes oxidization of some of the oil, and in this condition its action upon metals is very rapid. Cotton seed oil belongs to the class known as drying oils, because they oxidize upon exposure to the air. This makes them valuable to the painter, but condemns them for lubricating purposes.

It is then necessary to look for cotton seed adulteration when testing any oil, and fortunately there is a very simple method of detecting its presence or the presence of any of the drying oils, so called. The very fact of the oil being easy to oxidize is taken advantage of to detect its presence. To do this the suspected oil is treated with a chemical which completely oxidizes it in a very short space of time, leaving the mineral oil unchanged.

For this purpose chloride of sulphur is mixed with the oil, and quickly converts the drying oil which may be present into a solid, easily pulverulent mass, from which the unconverted oil may be removed by agitating it with bisulphide of carbon, which dissolves out all of the fixed oil. The carbon may be evaporated off, leaving the mineral oil to be weighed and compared with the weight of the oil tested.

There is, however, an exception or two to the statement made above, that all drying and no fixed oils are acted upon by chloride of sulphur. Castor oil is one notable exception. This oil, which is not regarded as a drying oil, is violently acted on by chloride of sulphur, and to prevent accident the re-

Fig. 10.

agent should be well diluted with bisulphide of carbon before it is put to work on the oil to be tested.

Oil which thickens at 40° Fahr. so as not to flow freely may cause mischief. A good lubricating oil should be only slightly altered in viscosity between 40° and 70° Fahr. Thickened oils sometimes do not flow freely even at 70°. Such oils are sometimes made by adding tarry residues obtained from vegetable oils or by the oxidization of the oils themselves. Instead of these petroleum oils of high viscosity should be used.

Petroleum oils do not act on brass, or the alloys usually used in bearings, as stated elsewhere, but the addition of thickened or slightly oxidized oil so as to make a more viscid compound is easily detected by the brass oil cup method described above, for if petroleum is not mixed with oil so thickened its action on metals is only slight after some time.

(To be continued.)

Mark A. Replogle, Cedar Falls, Ia., has published a brochure of forty-five pages entitled "Electricity and Water Power and Their Inter-Relations," a work designed for the instruction of non-professional busy men, mechanics and beginners in the so-called mysteries of electricity, a mission it seems to be capable of performing well.

Chlorine and Caustic Soda by Electrolysis.

An improvement in apparatus for producing caustic soda and chlorine gas or caustic potash and chlorine gas by the electrolysis of common salt in solution or chloride of potassium in solution consists in means for producing caustic soda and chlorine gas or caustic potash and chlorine gas by the action of electricity on common salt in solution or chloride of potassium in solution.

For this purpose an electrolytic cell containing two chambers is used. A porous pot, surrounded with wire, wire gauze or perforated sheet metal of the nature and in the manner hereinafter described, together with electric currents, is also employed.

Figure 1 illustrates the arrangement of the vessels and an electrolytic cell, the latter resting upon a pedestal, A.

The cell is composed of an outer vessel, B, made of cast iron. A porous pot, C, is placed within the cast iron vessel, leaving a space between the inner walls of the outer vessel B and the porous pot C. This porous pot contains two or more carbons secured to a disk of lead, D, which forms the lid of the porous pot, which lid is the anode of the cell C. The outer side of the porous pot must be closely and firmly wrapped with a very fine wire, wire gauze or finely perforated sheet of gold, silver, copper, brass, zinc, iron or platinum or other metal of suitable electrical conductivity as shown at T. After the porous pot has been thus covered with the metal described, it is immersed in a salt of mercury, say nitrate of mercury, for the purpose of coating the wire, wire gauze or perforated sheet of metal. In thus providing the pot with a metallic covering, it is necessary that the covering shall be reticular, that is to say it must have numerous small openings or interstices through which the liquid can pass to the pot. Coils of wire wound at a little distance apart around the pot are therefore the equivalent of wire gauze in which the wires cross one another, and of perforated metal.

E is the cathode and it is connected to the wire, wire gauze or perforated sheet of metal surrounding the porous pot.

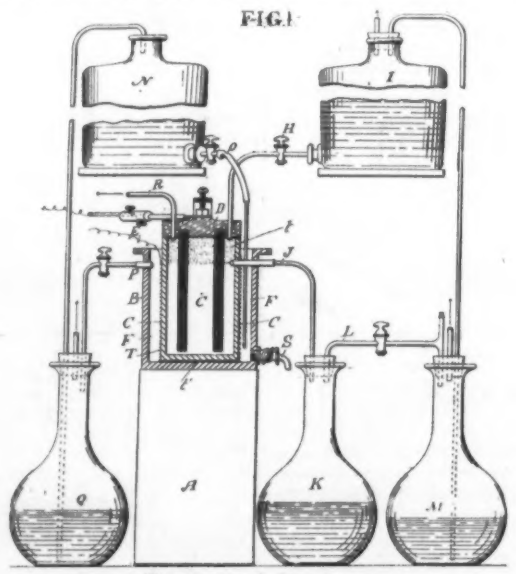
The space F formed between the outer vessel B and the inner vessel C is filled with water to the height of the overflow pipe P. After the introduction of water into the space F the top H of vessel I (which is filled with a strong solution of common salt or strong solution of chloride of potassium) is opened, allowing the liquor therein to flow into the anode side of the cell until it rises to the overflow J, when the liquor falls into the depositing tank or vessel K.

In the process of manufacture, the supernatant liquor in vessel K flows over through pipe L into vessel M, which when full is forced or pumped back into the upper vessel I, and thus the circulation of the liquor is continued. The vessel N is charged with water and flows through pipe O into the space F until the water rises to the level of the overflow pipe P, when it passes into the vessel Q, which when full is forced or pumped back into the vessel N, and so the circulation of the liquor continues. The electric current produced by a dynamo being now connected to the two poles of the cell, the electrolysis begins, and the brine or the solution of chloride of potassium in the inner cell C decomposes and chlorine passes off by pipe R, while sodium or potassium is deposited on the wire, wire gauze or perforated sheet of metal surrounding the porous pot C. The action of the flow of water through pipe O is to oxidize the sodium to soda, with liberation of hydrogen, or potassium to potash, the water being discharged through pipe P. This process may be continued until the solution of caustic soda or caustic potash attains any desired gravity or strength.

For covering the porous pot C preference is given to fine copper gauze treated with a salt of mercury. The mercury sustains no chemical waste by the action or process. At the same time it is not absolutely necessary to employ mercury, inasmuch as an inferior result can be obtained without its use. The chamber of the porous pot above the overflow pipe J should be coated or charged inside and outside with paraffine or other like substance to destroy its porosity, as also should the bottom of the pot on the outside, bringing the paraffine in contact with the wire, wire gauze or perforated sheet of metal.

The paraffine coating is shown under the pot at *f* in Fig. 1.

FIG. 1



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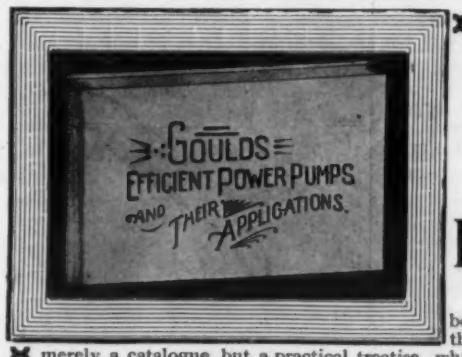

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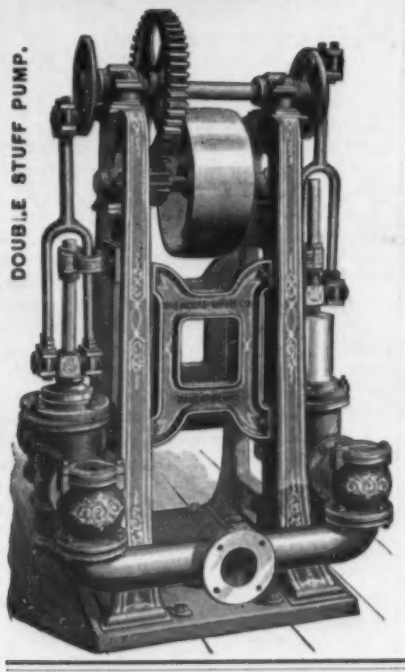

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Illustrated Catalogue upon application.

Imports and Exports.

IMPORTS AT NEW YORK.

FOR THE WEEK ENDED NOVEMBER 23, 1894.

An. Colors..	802	$53,247	Paper.....	706	$35,454
Alum.....	—	—	Steel Pens...	7	3,174
Alum's Cake	—	—	Stationery...	66	997
Bl. Powders	886	17,532	Slate Pencils	26	177
Soda Ash...	8,846	22,822	Clay.....	—	2,895
Soda, Caus.	1,126	13,455	J'te B'ts, &c.	—	—
Soda, Sal...	1,481	2,355	P. Hangings	5	202
Soda, Hypo.	—	—	P'p'r Stock..	6,615	37,914
Ultramarine	54	2,217	Terra Alba..	250	873
Books.....	490	55,795	Waste.....	100	6,524
Newspapers.	286	7,291	Wood Pulp..	2,689	13,724
Engravings.	121	10,563			
Ink.....	104	1,869			
Lead Pencils	6	927	Totals...	24,726	290,006

Imports General Merchandise for the week ended November 23, 1894.....$8,587,981

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO NOVEMBER 28, 1894.

Whence Imported.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales.	Bales.	Tons.	Tons.	Bales.
Alexandria...	1,249	....	....	....	....
Almeria.....	....	....	....	....	211
Antwerp.....	1,922	364	882	....	14,378
Aspinwall....	90	....	....	....	....
Bordeaux.....	684	....	....	....	....
Bremen.....	1,951	66	6	....	8,893
Bristol.....	....	....	....	....	4,199
Buenos Ayres.	157	....	....	....	....
Calcutta.....	....	....	....	....	3,063
Cent. America	130	....	....	....	....
Christiania....	....	....	586	....	749
Copenhagen..	830	....	1,746	....	2,336
Dublin.....	....	186	....	....	....
Dundee.....	....	....	....	....	954
Dunedin.....	....	....	....	....	183
Fiume.....	....	....	99	....	....
Geestemunde.	252	....	....	....	1,347
Genoa.....	100	....	35	....	4,524
Glasgow.....	627	118	18	....	523
Gothenburg..	91	....	107	....	....
Hamburg.....	2,177	377	570	....	4,972
Hamilton.....	....	....	....	....	42
Hiogo.....	9,001	....	....	....	....
Hong Kong...	43	....	....	....	....
Hull.....a	3,440	195	1,598	....	17,312
Kobe.....	34,395	....	....	....	....
Leghorn.....	2,384	....	....	....	....
Leith.....	....	159	....	....	138
Liverpool.....	1,551	1,073	....	....	39,521
London.....	5,980	2,389	28	....	13,454
Marseilles....	466	....	....	....	486
Nassau.....	48	....	....	....	15
Newcastle....	....	286	....	....	4,358
Rio.....	26	....	....	....	....
Rotterdam....	2,657	119	919	....	10,446
Southampton.	....	....	....	....	160
Stettin.....	8,330	45	800	....	9,560
Trieste.....	....	....	49	....	....

a. Including 347 bales cotton waste.

NEW YORK IMPORTS.

FROM NOVEMBER 21 TO NOVEMBER 28, 1894.

Paper Stock.

Castle & Gottheil, Thingvalla, Copenhagen, 15 tons chemical fibre.

F. Bertuch & Co., by same, 195 tons chemical fibre, 98 bs. manillas.

Lewy Brothers, by same, 40 bs. linen rags.

Jessup & Moore Paper Company, Werra, Genoa, 100 bs. rags.

F. Bertuch & Co., Powhatan, Genoa, 35 tons chemical fibre.

J. Libmann & Co., Peruvian, Glasgow, 94 bs. rags.

Train, Smith & Co., Galileo, Hull, 105 bs. bagging.

Burgass & Co., by same, 77 bs. manillas.

J. W. Mason & Co., Bovic, Liverpool, 65 bs. manillas.

Darmstadt & Scott, by same, 28 bs. rags.

James Pirnie, by same, 50 bs. rags, 100 bs. manillas.

Horace Dutton & Co., Oakley, Liverpool, 112 bs. manillas.

James Pirnie, by same, 1,498 bs. manillas.

J. Libmann & Co., by same, 45 bs. rags.

Train, Smith & Co., The Queen, London, 143 bs. bagging.

J. Libmann & Co., by same, 15 bs. rags.

Lewy Brothers, by same, 140 bs. rags.

Burgass & Co., by same, 23 bs. papers.

Train, Smith & Co., Spaarndam, Rotterdam, 302 bs. rags, 135 bs. bagging.

Castle & Gottheil, Slavonic, Stettin, 15 tons chemical fibre.

Paper.

Lazard Brothers, Rhynland, Antwerp, 17 bs.

Kupfer Brothers, by same, 27 cs.

L. C. Wagner, by same, 8 cs.

C. Georg, by same, 58 cs.

Scovill Manufacturing Company, by same, 16 cs.

G. W. Sheldon & Co., by same, 50 cs.

Dingelstedt & Co., by same, 13 cs.

W. P. Buchanan & Co., by same, 28 cs.

Photo Material Company, by same, 10 cs.

O. T. Melvin, by same, 2 cs.

E. & H. T. Anthony & Co., Britannic, Liverpool, 1 cs.

Robert Graves & Co., Lucania, Liverpool, 3 cs. hangings.

Dennison Manufacturing Company, by same, 40 cs.

J. Dickerson & Co., by same, 4 cs.

W. Heuermann, Scandia, Hamburg, 10 cs.

R. F. Downing & Co., by same, 12 cs.

A. V. Benoit, by same, 30 rolls.

Schall & Co., Rhaetia, Hamburg, 9 bs.

John Munroe Company, by same, 20 bs.

Neuss, Hesslein & Co., Spaarndam, Rotterdam, 11 cs.

John Hunter, Galileo, Hull, 6 cs.

Special List of Imports of Paper Stock at the Port of New York for the month ended November 30, 1894.

Importers.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales	Bales	Tons.	Tons.	Bales
Atterbury Bros.....	68	17	....	....	....
Bertuch, F., & Co...	....	....	700	....	156
Burgass & Co.....	....	23	....	....	77
Castle & Gottheil ...	....	....	68	....	....
Darmstadt & Scott..	28	....	....	....	....
Dutton, H., & Co....	....	....	....	....	288
Hagemeyer & Brun.	79	41	....	....	78
Hamilton, G	....	....	36	....	....
Hatton, E., & Co	946	....	....	....	159
Helwig, R.....	....	....	57	....	....
Jessup & Moore Paper Co.....	100	....	....	....	....
Lewy Brothers.....	2,651	45	....	....	352
Libmann, J.....	....	....	....	....	72
Libmann, J., & Co....	267	....	....	....	....
Lvon, J. H. & Co....	34	....	....	....	....
Mason, J. W., & Co.	....	....	....	....	68
Overton, R. H., & Son.	....	....	....	....	309
Pells & Co.....	....	10	....	....	....
Perkins, Goodwin & Co.....	494	....	225	....	638
Pirnie, James.....	50	24	....	....	4,481
Rau, G.....	204	....	145	....	....
Salomon, Felix, & Co.	84	....	....	....	507
Salomon L. A., & Co.	....	....	....	....	127
Stratford, G.....	....	76	....	....	....
Train, Smith & Co..	302	....	....	....	2,737
Zinghaus, W.....	....	....	1	....	....
Totals	4,607	236	1,227	...	10,035

IMPORTS of Rags and other Paper Stock at the Port of New York for the month ended November 30, 1894, from the following named Ports, showing Quantities from each Port.

Whence Imported.	*Rags.*	*Old Papers.*	*Chemical Fibre.*	*Ground Wood.*	*Manilla Stock.*
	Bales	Bales	Tons.	Tons	Bales
Antwerp	68	—	1	—	494
Bremen.....	225	41	—	—	1,403
Copenhagen.....	40	—	510	—	407
Dundee.....	—	—	—	—	72
Genoa.....	100	—	35	—	—
Glasgow.....	24	41	—	—	—
Hamburg.....	85	—	35	—	431
Hull.....	45	10	429	—	504
Liverpool	168	—	—	—	4,735
London.....	48	90	—	—	1,501
Newcastle.....	—	—	—	—	171
Rotterdam.....	302	—	202	—	135
Stettin.....	2,905	45	15	—	192
Totals.....	4,607	236	1,227	—	10,035

BOSTON IMPORTS.

FROM NOVEMBER 22 TO NOVEMBER 28, 1894, INCLUSIVE.

Paper, &c.

Wm. Guild & Co., Catalonia, Liverpool, 5 bs. periodicals.

Geo. C. Whitney Company, by same, 1 cs. cards.

Frost & Adams, by same, 1 cs. tracing paper.

Benj. French & Co., by same, 1 cs. photo paper.

Dennison Manufacturing Company, Kansas, Liverpool, 4 to 12 cs. tissue paper.

J. Dickinson & Co., Philadelphian, Liverpool, 11 cs. paper.

American Express Company, by same, 1 cs. stationery.

Hooper, Lewis & Co., Venetian, London, 2 cs. stationery.

Paper Stock.

Train, Smith & Co., Venetian, London, 413 bs. rags, 27 bs. manillas, 102 bs. waste paper.

C. A. Cheney, by same, 62 bs. waste paper.

Wheelwright Paper Company, by same, 280 bs. waste paper.

Crocker, Burbank & Co., by same, 557 bs. waste paper.

Horace Dutton & Co., by same, 125 bs. flax waste, 113 bs. waste paper, 150 coils manillas.

Castle & Gottheil, by same, 75 bs. rags.

Perkins, Goodwin & Co., by same, 67 bs. manillas.

C. P. Sumner & Co., by same, 112 bs. waste paper.

T. F. Ring, by same, 5 bs. manillas.

Train, Smith & Co., British Queen, London, 210 bs. manillas.

Horace Dutton & Co., by same, 223 bs. rags.

C. A. Cheney, Philadelphian, Liverpool, 12 bs. rags, 118 bs. manillas.

C. A. Cheney, Kansas, Liverpool, 92 bs. manillas, 60 bs. cotton waste.

R. H. Overton & Son, by same, 8 bs. manillas.

Sizing.

E. W. McClintock, Catalonia, Liverpool, 113 bags.

Thomas Groom & Co., by same, 72 bags.

Bleaching Powder.

J. L. & D. S. Riker, Kansas, Liverpool, 171 cks.

J. L. & D. S. Riker, Philadelphian, Liverpool, 191 cks.

Caustic Soda.

Wilson, Patterson & Co., Kansas, Liverpool, 150 drums.

Soda Ash.

Warren & Co., Kansas, Liverpool, 70 cks.

J. B. Moore & Co., by same, 16 cks.

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NEW YORK.

Wing & Evans, Catalonia, Liverpool, 126 cks.

Bowman, Thompson & Co., by same, 22 cks.

Wing & Evans, Philadelphian, Liverpool, 27 cks. and 1,080 bags.

Morey & Co., by same, 32 cks.

Linder & Meyer, by same, 20 cks.

Soda Crystals.

Warren & Co., Kansas, Liverpool, 140 bbls.

Warren & Co., Philadelphian, Liverpool, 140 bbls.

Jerome Marble & Co., by same, 140 bbls.

Crude Sulphur.

Linder & Meyer, Philadelphian, Liverpool, 3,103 bags.

EXPORTS of Paper, &c., from New York for the Week Ended November 27, 1894.

BOOKS, cases, to Amsterdam, 2; British Australasia, 7; Bremen, 1; Brazil, 4; British West Indies, 12; British Guiana, 1; Cuba, 12; Dutch West Indies, 4; French possessions in Africa, 1; Hamburg, 17; Helsingfors, 1; London, 12; Mexico, 3; Reval, 2; Southampton, 7; Colombia, 3; Uruguay, 1; Venezuela, 5.

PAPER, to Chili, 1 cs.; Cuba, 739 pkgs.; Central America, 6 pkgs.; Hamburg, 12 pkgs.; Hayti, 5 pkgs.; London, 69 cs.; Liverpool, 98 cs.; Mexico, 72 pkgs.; Newfoundland, 27 rolls; Nova Scotia, 9 bdls.; Rotterdam, 3 cs.; Southampton, 40 cs.; San Domingo, 6 pkgs; Colombia, 52 pkgs.; Venezuela, 10 cs.

STATIONERY, cases, to British Australasia, 46; Bremen, 3; British East Indies, 1; British West Indies, 12; Cuba, 11; Central America, 4; Dutch West Indies, 4; Genoa, 11; Japan, 10; London, 77; Liverpool, 2; Mexico, 22; New Zealand, 3; New Brunswick, 3; Newfoundland, 2; Peru, 1; Southampton, 23; Colombia, 11; Venezuela, 18.

TAGS, cases, to Liverpool, 1.

TWINE, bales, to British West Indies, 2; Dutch West Indies, 17; French West Indies, 1; Mexico, 1; San Domingo, 2; Venezuela, 13; New Zealand, 1 pkg.

WALL PAPER, cases, to Hayti, 2.

CARDS, cases, to Havre, 1.

STRAWBOARD, to Cuba, 37 pkgs.; Mexico, 2 cs.

AGGREGATES AND VALUES.

Paper, reams.....	—	—
Paper, pkgs.....	1,416	$8,072
Paper, cases.....	196	3,360
Books, cases.....	101	4,598
Stationery, cases.....	257	9,636
Rosin, bbls.....	4,306	13,188
Totals.....	5,276	$38,844

Exports General Merchandise for the week ended November 27, 1894..... $6,630,204

PRESSES. Hand Power. Steam Power. Knuckle Joint. All Kinds. For Baling and Packing purposes. Illustrated Catalogue.
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ALL CAREFULLY SORTED AND PREPARED.

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NEW YORK: SATURDAY, DECEMBER 1, 1894.

REMOVAL.

On or before February 1, 1895, THE LOCKWOOD PRESS will remove to the large and modern building on the northwest corner of Bleecker Street and South Fifth Avenue, adjoining the Bleecker Street station of the Sixth Avenue Elevated Railroad and four short blocks west of Broadway. In addition to the Elevated Railroad, three street car lines and the Fifth Avenue Stages pass the door.

IN press: HOFMANN'S TREATISE ON PAPER MAKING; to be published in twenty parts of about eighty pages each, at intervals of not less than sixty days; price *one dollar* cash in advance for each part, postpaid. Part One will appear on November 30. Persons desiring this work should not delay in sending in their orders.

THE CHEMISTRY OF PAPER MAKING is now on the market; octavo, 532 pages, cloth, $5.00, postpaid. Any reader of THE PAPER TRADE JOURNAL interested in the subject could not make a better investment of the money. Particulars in another column.

THE AMERICAN DICTIONARY OF PRINTING AND BOOKMAKING will be delivered to any person sending twelve dollars for it. This great work, royal octavo, 600 pages, half-bound, is a mine of information on every subject comprehended by its title.

HOWARD LOCKWOOD & CO.

PART I, of HOFMANN'S TREATISE ON PAPER MAKING will be forwarded to subscribers to-day. Claims for missing copies must be made within thirty days from the date of this notification.

IT is anticipated that the President will, in his forthcoming message, suggest changes in the monetary system of the country and possibly ask for the creation of a commission to examine into the whole question in a thorough nonpartisan temper, and report its investigations and recommendations to Congress. The currency question concerns the people more closely than any other matter subject to legislative control, as on it rests the stability of commercial and industrial undertakings of all kinds. It should not, therefore, be the football of partisan feeling or the subject of superficial investigation or hasty action. Whatever is decided upon should be the outcome of a sense of grave responsibility, deliberate wisdom and prudent caution.

NOTES drawn in the State of New York on and after January 1, 1895, will have no days of grace. The change will be welcomed in the interest of simple business methods. Days of grace might have been a convenience in times when communication was slow and uncertain, and when they were what their name implies, a gracious reprieve; but in these later days their chief office has been to bother bookkeepers in reckoning interest. They are business rubbish of which we are well rid.

SINCE our last issue the bond issue has been settled; much better, in fact, than was anticipated forty-eight hours before the bids were made, the whole issue having been taken by a syndicate of well-known bankers, who pledged themselves not to draw the purchase money from the Sub-Treasury. The sum realized not only makes the reserve good, but leaves a considerable margin besides. It is to be hoped that no further issue of bonds will be found necessary, yet it would be well for Congress to provide against contingencies and make the threatening conditions which surrounded the present issue impossible of repetition. In other countries bonds in small denominations are eagerly taken up by the people. Thus far our people have had no opportunity to make such an investment of their savings, the size of the bonds being practically prohibitory to small investors. If we must have a bonded debt, by all means let at least some part of it accrue to the advantage of the common people. With such a stake in the Government, we believe that the masses would be more attentive to the duties of good citizenship and closer students of public men and measures, all of which would be of untold benefit to the nation politically, financially and morally. We may note here the fact that the new loan was placed more favorably to the Government than any preceding it, the bid accepted practically netting the takers an interest of only 2.87. From this it is safe to conclude that investors are, and will be for some time, content with smaller returns on investments. Indeed it is doubtful if the old interest averages will ever return, safety being a more important factor with men of large capital than big interest, a condition not to be deplored.

SOME of the advantages of the Wilson tariff are set forth in late reports from consuls, issued in advance sheets from the Department of State. These reports concur in announcing a revival of trade with the United States and an activity for which certain centres of European industry have been longing and waiting. It probably will not be a matter of great concern to many people that the advantages cited all tend in one direction; that is to say, to the benefit of the foreign producer, the American manufacturer not being "in it," so to speak. The Consul at Bradford, England, says that the passage of the Wilson bill "revived courage and spirits" at that point and "has certainly created a cheerful feeling," and "one of the most noticeable features has been a strengthening in prices." Under the McKinley tariff the value of the exports from Bradford to the United States shrank 47¼ per cent.; but we are now told that the exporters of that manufacturing centre regard the Wilson tariff "as the first break—the entering wedge," and this may be accepted as an indication that they expect more. The consuls at Glasgow and Sheffield write in the same vein; while from Marseilles, France, comes the announcement of an increase of over 400 per cent. in the exports from that port to this country for the month of September compared with the same month last year. It may be a matter of indifference to foreign producers and their friends in America who labor so zealously in their behalf if our mills shut down and if our workingmen are unemployed or are compelled to accept reduced wages; but it certainly does concern the American people who on this issue have lately pronounced judgment. Mr. Gresham is to be congratulated on the clearness with which his subordinates set forth the fact that the Wilson tariff is of great benefit—to the foreign manufacturer.

PAPER STOCK IMPORTS.

The imports of rags and other paper making fibres—jute butts excepted—at the port of New York during the month ended November 30, as reported, amounted to 14,878 bales and 1,277 tons, the difference in quantities compared with the corresponding month of 1893 being a decrease in rags of 2,126 bales, in old papers an increase of 143 bales, and in manilla stocks an increase of 3,487 bales. There was no wood pulp imported during November, and of chemical fibre 1,022 tons more than the October imports were brought in. The appended tabulation shows the quantities of paper making materials of the kinds mentioned which were reported as having been imported during the month of November for the last five years:

	1894.	1893.	1892.	1891.	1890.
Rags.....bales.	4,607	6,733	3,237	12,404	10,698
Old Papers.....	236	379	1,905	677	748
Manilla Stocks..	10,035	6,548	8,545	35,521	7,310
Wood Pulp,tons.	....	....	....	....	....
Wood Fibre.....	1,227	321	4,676	1,533	2,991

The arrivals from the different ports were as follows: Antwerp, 68 bales rags, 1 ton chemical fibre, 494 bales manillas; Bremen, 325 bales rags, 41 bales old papers, 1,403 bales manillas; Copenhagen, 40 bales rags, 510 tons chemical fibre, 407 bales manillas; Dundee, 72 bales manillas; Glasgow, 24 bales rags, 41 bales old papers; Genoa, 100 bales rags, 35 tons chemical fibre; Hamburg, 84 bales rags, 35 tons chemical fibre, 431 bales manillas; Hull, 45 bales rags, 10 bales old papers, 429 tons chemical fibre, 504 bales manillas; Liverpool, 168 bales rags, 4,725 bales manillas; London, 48 bales rags, 99 bales old papers, 1,501 bales manillas; Newcastle, 171 bales manillas; Rotterdam, 302 bales rags, 202 tons chemical fibre, 135 bales manillas, and Stettin, 2,965 bales rags, 45 bales old papers, 15 tons chemical fibre, 192 bales manillas.

Watermarks.

BY DANDY.

A paper merchant of New York sent a shipment of paper to a customer by "fast freight." The paper didn't get along very fast, and after a good deal of delay reached the customer, who wrote back as follows:

"While the world's record for fast time may not have been broken on this occasion we cannot, however, refrain from reflecting on the fact that matters might be worse were it not for the foresight of the mill folks in forwarding by 'fast freight'; what a fearful fix we would be in! Our lives would be freighted with fears and forebodings, frettings and fumings for the fearful fate of this paper, if it failed to come by any freight other than the 'fast freight.' What a weary waste would such a wretched life be, wistfully watching and wofully waiting for any other than 'fast freight — wondering would it come, and when it would come; would the paper be wormy or wrinkled—or, in other words, would it wear whiskers? Fortunately, however, it came by 'fast freight,' and this troublesome, tortuous train of thought is terminated."

That's "the truth, the whole truth, and nothing but the truth." "Fast freight" is indeed a great institution.

"What is Butterworth?" Well, some would say 35 cents, others might say a famous footballist, and yet others a promoter. The latter has gone back to Wisconsin. Thinks he has a "dead cinch" on all the mills that are worth having, and wants people to believe that one of the latest and best mills is of no account, which reminds me of the old saying, "All in my eye, Betty Martin."

I believe that he claims to have secured a very large part of the money from New York and other Eastern centres, but this was to be the purchase of an English syndicate, you know, and was to be paid in pounds, shillings and pence. Now it has dropped down to dollars with the bird on them.

I wonder can Butterworth kick a goal? It looks as though he was playing tackle without knowing how, and that somebody was going "round the end."

How is this for a story from the far continent? "A tall, lanky countryman walked into a Melbourne newspaper office recently and said he wanted an "In memoriam" notice in the obituary column of the paper. "My ole guv'nor died a year ago," he explained, "and I should like a bit o' poetry in the paper about him." "All right," replied the clerk. "Our charge for 'In memoriam' notices is 6 shillings an inch." A look of intense amazement passed over the countryman's face. "Good gracious!" he cried as he made for the door, "I can't afford that—my guv'nor was 6 feet high."

The "paper king" has arrived in New York and may now be addressed "Care of the Warden, the Tombs, New York." He calls himself "Professor Meyer, the Paper King," and walked from Maine to California dressed in paper, and is now "in hock," owing to the fact that he possessed a temporary aberration that an overcoat and dress suit, belonging to a landlady, was his.

Just what a landlady was doing with an overcoat and a dress suit I don't know. Probably the "Paper King" didn't know, and the effort to solve the problem cost him his liberty.

He claims to have lived on paper and milk, but fails to state the particular brand of the former. It must have been blotting, as that is the choicest absorbent known.

Trade Talks.

Felix Salomon, of Felix Salomon & Co., New York.—St. Blasien, where I spent last winter for the benefit of my health, is in the southern part of the Black Forest, about 15 miles northeast of Bale. You can get to it by two different railroads, one north and the other south of it, and then you have either a carriage or mail coach ride of three or four hours from the railroad station. It is about 2,800 feet above the level of the sea, and is surrounded by mountains 1,500 feet higher, and these mountains shut off storms from all quarters except from the west and southwest. They shut off the east winds, which are especially dangerous to people afflicted with lung trouble. This class of people, and even those who are in the advanced stages of the disease, have presented to them at this place an opportunity to be cured. The entire treatment at St. Blasien consists in good nourishment, fresh air and plenty of exercise, so as to keep the lungs in good working order, and thus enable them to throw off whatever disease may be lodged there. When you think of a sanitarium you do not at first fancy the idea, the more especially when you think of being kept there for six months, but after you have been there a short time you feel thoroughly satisfied, especially when you notice the great care they take of you.

When you reach the place a physician examines you, takes your weight, makes notes of all your characteristics, and thereafter once a week, on the same day of the week as that on which the first visit was made, he examines and weighs you. The idea is to have you gain in weight. In six months I managed to gain 20 pounds, and all owing to good nourishment, plenty of exercise and pure, invigorating air. In winter before breakfast you have a cold sponge bath, administered by an attendant who comes to your room. He puts a wet cloth around your entire body and rubs on the outside of the cloth until its temperature and that of your body are equalized. Then he quickly throws this cloth off and puts a dry one around you, after which you are sent to bed for half an hour. Then you rise, dress and have breakfast. In winter from 10 and in summer from 8 you will walk for one, two or three hours, each day the walk being a little longer, and in places steeper and higher, all of this being under the direction of a physician. From 12 to 1 you will lie in an easy chair on the balcony, being well wrapped up in blankets, one of the main points being not to catch cold or get wet or damp feet. At 1 o'clock you have your dinner, and a substantial one of six or eight courses it is. From 2 to 4 you lie again on the balcony, and from 4 to 5 in winter and from 5 to 7 in summer you can take another walk, not exceeding two hours. You have supper at about 7, and after that you remain in the house. There are very beautiful places in the neighborhood where you can walk or drive, and in the winter you can also take sleigh rides. From three or four of these places you can have a very fine view of the entire range of the Alps for a distance of about 200 miles in length, from the Santis to Mont Blanc, with the heights and peaks between, including Todi, Rigi, Pilatus, Jungfrau, &c. It is a fine view, and while in summer it is sometimes foggy, in winter the air is clear, and you can see a great deal more.

One of the many influences which operate to provide pure air for St. Blazien is the fact that for 40 miles toward the four quarters it is surrounded by heavy fir trees, and dust and other impurities are held back by these forests. That is one reason why this place is so much more healthy than many other places in Europe as well as in this country. It may be hard for an American to be a schoolboy again and to live his daily life according to rules and regulations, but when you consider your health you are apt to do a good many things. We have good places in the United States—Colorado, parts of New Mexico and in some of the Southern States—all of which have fine air, but you certainly cannot get as good nourishment and care as you can in Europe, nor are the physicians in our American health resorts (I say it with all due respect) quite up to the European doctors, especially in this particular line.

While a good many people would give anything to be cured of a treacherous lung trouble, this place is not expensive according to American ideas. For $2 to $2.50 per day you have the best of food and attention, including the fees of the physician and the little medicine you may need. This is cheaper than at the American health resorts, and when it is considered that consumption has been cured, and even hasty consumption after a stay of two years, the readers of THE JOURNAL will agree with me that St. Blasien is a good place.

The temperature of the place in summer is cool on account of the woods, which are right around it, and in winter, during January, February and March, you have from 4° to 10° Fahr. during the night, which, of course, the patients do not notice, as they are indoors from 5 P. M to 10 A. M.; and during the day from 10 or 11 until sunset, which is 3 or 4 o'clock, you may have a temperature of 80° to 90° Fahr., so that even in winter you have as warm air during the middle of the day as in many of the other places in summer. During many of the days in January and February, while there was snow on the ground, we used to take our meals on the balcony.

One thing I forgot, and that is that a part of the treatment consists in serving to you three or four times a day boiled milk, which you drink warm or hot. If anybody is thinking of going there I will be very glad to give him any information I have.

Maurice O'Meara, 448 Pearl street, New York—Judging from my own business I think that there has been an improvement in the situation, and it is now what might be called fair—yes, very fair. The only trouble is that profits are very close; but that is nothing new, I suppose. I may go further and say that business is not only good, but it is improving all the time. I have been now going on about thirty-eight years, that is in the paper stock trade; I am also engaged in selling paper, but this has only been a part of my business for the last four or five years. Looking back for forty years on the past, New York has had a wonderful growth and one would hardly believe it had he not lived through it. It is marvelous. As trade has expanded, firms have gradually removed from one part of the city to another and these removals have generally been northward. Jaffray, for instance, used to be on the corner of Broadway and Exchange place and Claflin was located where the Trinity Building now stands, formerly the site of the City Hotel. He was the first I think to remove. I myself used to live on New street, where the Stock Exchange is today. All that section of the town as well as Murray and other streets on that side used to be residential streets, and State street and Bowling Green were the bonton portion of the city, where the Whitneys and all those other old and well-known families dwelt. Trade to-day is just the same as it was then; its tendency is uptown, and as New York grows in population and her trade correspondingly increases the business centre will continue to change. The leaning of the paper trade is to hang together and keep in one place; but it, I think, will also eventually be found uptown. Several paper houses have already gone in that direction, and I see that THE PAPER TRADE JOURNAL is also about to change its location. I think that the change is good. I can easily remember when Bleecker street had not one store upon it. There were dwellings, but the residences and tenements have been gradually driven farther and farther away and business houses have taken their places. Methods of doing business have changed; prices have changed; processes of manufacture have changed. I was much interested the other day in looking at the wrapping paper which came around some presents which my family had bought. There were all kinds, all weights and all colors. It forced upon me the reflection that the paper trade is a large industry—perhaps the largest in the country—that paper is used for almost every purpose and by almost everybody. I think that the Yankee can excel everyone in the manufacture of paper, and now that our production is so large we need and must have something besides

our home market in which to sell it. We have already sent our paper and fibre abroad in considerable amounts, and if we had been told five years ago that sulphite fibre would be shipped from this country to foreign markets the statement would have been laughed at. I think the means by which we ought to secure this foreign market is reciprocity. That seems to me to be the proper method. I have not given the financial problem much attention. I think that if a man studies his own business and deals successfully with such financial problems as he has to meet there, he has got about all he can do.

Communications.

Taking Out The Breast Roll.

Editor of The Paper Trade Journal:

One of the best schemes I have ever seen for taking out the breast roll I saw at the Shattuck & Babcock Company's Mill, De Pere, Wis. The roll on the large machine at the mill being very heavy, W. H. Goodenough, the superintendent, devised the following plan of operation:

He raised the roll with chain falls on each end, and then put on the machine frame a plank with an iron track half way on the front of the frame. Another plank was put on the other half and clamped over the frame, the outer plank resting on two wooden horses, making a continuous track twice the length of the roll. On this track two trucks were placed to receive the journal of the breast roll, which was then pushed to the outer track; the inside part was taken away, the wire was put on, the inside track was put between the wire and the roll was pushed back to place without lifting a pound and perfectly safe. The machine tender tells me that it is the best thing he ever saw; there is no patent on it either.

OLD PAPER MAKER.

American Paper Manufacturers' Association.

WATERTOWN, N. Y., November 27, 1894.

To the Members of the American Paper Manufacturers' Association:

At a meeting held last week by the officers of our association it was decided to hold our winter meeting in the city of New York, at Delmonico's, Twenty-sixth street and Fifth avenue, on Wednesday, January 30, 1895, at 11 A. M.

Committees have been appointed who will make important reports concerning transportation, classification, condition of the export trade and other matters of great interest to all manufacturers of paper.

The meeting will remain in continuous session until these reports and such other business as may come up is disposed of, when it will adjourn and the members will dine at Delmonico's at 7:30 P. M.

This timely notice is sent to you so that you may keep that day and evening open in the interests of our association. In due time the entertainment committee will furnish you information concerning the arrangements for dinner. It is hoped that all our members will take a deep interest in this first winter meeting.

A. G. PAINE, President.
G. C. SHERMAN, Secretary.

Changes, Removals and New Firms.

The *Sun*, Bennett, Pa., has suspended.

R. M. Smith, publisher, Bryan, Tex., has sold out.

The *Polytechnic Review*, Iona, N. J., is a new paper.

The *Daily Tidings*, Emporia, Kan., has suspended.

The *Republican*, Fairmont, W. Va., is a new paper.

The *Daily News*, Salamanca, N. Y., is a new paper.

Holland, Man., has a new paper called the *Observer*.

J. Frank Stone, stationer, &c., Ketchum, Idaho, has sold out.

The *New Republic*, Akron, Ohio, a daily paper, has suspended.

D. L. Feeser, stationer, &c., Crete, Neb., is closing out his business.

The *Enterprise*, Conroe, Tex., has removed to Huntsville, Ala.

F. Morrison, printer, Schomberg, Ont., has removed to Collingwood.

P. S. Dodge, publisher of the *Clipper*, Stanton, Mass., has sold out.

Willie Towell, dealer in stationery, &c., Columbus, Tex., has sold out.

The Wm. M. Edwards Company, stationer, Los Angeles, Cal., has sold out.

B. J. Smith has purchased the *Herald*, Ava, Mo., from George B. Waters.

The Great Western Wall Paper Company, Chicago, is a new jobbing concern.

Frank Morrison, printer, Schomberg, Ont., has sold out to Mills & Brown.

Rev. Chas. S. Ott, St. Joseph, Mo., has become the owner of *Der Wachter*, Kansas City, Kan., through chattel mortgage foreclosure.

Charles Allen has started in the wholesale paper business at Sioux City, Ia.

The *Sanilac Jeffersonian*, Lexington, Mich., has removed to Croswell, Mich.

Cleveland, Ohio, has a new weekly called the *Courier*, edited by F. Edwin Gould.

Cline & Matters, publishers, Joplin, Mo., have been succeeded by Green B. Young.

The *Tribune* Publishing Company, Winnipeg, Man., has applied for incorporation.

The *Southwest*, Springfield, Mo., is a new illustrated paper, edited by G. A. Atwood.

Phillip Kraft, dealer in wall paper, Chicago, Ill., has been succeeded by Fred Kraft.

Parkhill, Ont., has a new weekly paper called the *Independent*, published by Kan & Bryant.

W. H. Gibson, publisher, Dixon, Neb., has been succeeded by the *Tribune* Printing Company.

San Francisco, Cal., has a new monthly magazine called *Chic*, which is devoted to general topics.

Christman & Wilms, paper box manufacturers, Holyoke, Mass., have sold out to Garrit S. Avery.

Graham & Son, publishers of the *Enterprise*, Melita, Man., have been succeeded by J. B. Graham.

Dove & Walther, dealers in paper and twine, Chicago, Ill., have been succeeded by E. W. Copelin.

A. L. Harding, publisher, Appleton City, Mo., has been succeeded by the *Herald* Printing Company.

The National Tablet and Printing Company, Dayton, Ohio, has been succeeded by Slater & Berlsford.

The *Trolley*, Des Moines, Ia., is a new weekly paper and the official organ of the street railway employees.

J. B. Koke, dealer in newspapers and stationery, Mount Vernon, N. Y., has sold out to H. Holleander & Co.

The *Jewish Volksblatt*, Philadelphia, Pa, is a new weekly paper issued in the interests of the Jewish people.

Arichat, N. S., has a new paper called the *Record*, published by D. H. Campbell and A. E. Morrison, of Forest, Ont.

The *Niagara Spray*, Lockport, N. Y., is a new monthly magazine, published by Daniel J. Penfold and John Smith.

New Haven, Conn., has a new monthly publication called the *Mother's Journal*, which will cater to the interests of the home.

Slater, Dillman & Heindle, printers, Dayton, Ohio, have been succeeded by Dillman & Heindle.

The Riverside Paper Company, Glastonbury, Conn., has published its articles of association. The capital stock is $12,000.

The plant of the *News*, Mission City, B. C., has been removed to Union, same province, where the paper will be issued in future.

Cupples & Patterson, publishers and booksellers, Boston, Mass., have dissolved partnership, Joseph G. Cupples continuing the business.

The Oskaloosa *Daily News* Publishing Company, Oskaloosa, Ia., has been incorporated under the style of the Oskaloosa *News* Company.

Pittsburg, Pa., has a new publication called the *Reveille*, edited by Rev. W. W. Faris, and representing the local Christian Endeavor societies.

The Crowell Manufacturing Company, Rockport, Mass., has been incorporated to build a paper mill, and will employ about fifty hands. Capital stock, $30,000.

Chas H. Trousdale, publisher of the *Evening News*, Monroe, La., has sold an interest in that paper to Ed. Wisner, who has assumed its editorial management.

The Savannah Printing and Publishing Company, Savannah, Ga., has been incorporated to conduct a printing, bookbinding, publishing and job printing business. Capital stock, $3,000.

A new paper is *El Heraldo de la Exportacion*, New York. Wallace B. Flint is president and J. C. d'Azevedo vice-president and general manager of the company which publishes it.

The *State Journal*, Huron, S. Dak., has been purchased and absorbed by the *Huronite*, which will be removed to Chattanooga, Tenn., and appear as a real estate and commercial paper.

The Eaton-Dunlap Company, just formed in Boston, will publish a new magazine to be conducted along the lines of *Wide Awake*. It will be called the *Young People's Magazine*, and will be printed in Holyoke, Mass.

The Book and Stationery Company, Temple, Tex., has been chartered with a capital stock of $1,600. The incorporators are R. T. Crawford, John A. Cole, J. M. Crawford, Sidney Goodwin, R. B. Buckingham and E. H. Wynne.

St. Louis, Mo., has a new weekly paper called the *American Eagle*, an organ of the negro race, edited by Wm. F. Farmer.

The *Nonpareil*, Council Bluffs, Ia., was sold at a receiver's sale on November 10 for $5,000 for the personal property and $8,000 for the real estate, E. E. Hart being the purchaser for an organization composed of J. J. Steadman, J. H. Purcell and himself.

The *Herald*, Calgary, Alberta, N. W. T., will be revived by a new company, the officers of which are Harry Symonds, president; Hon. J. A. Lougheed, vice-president, and John A. Reed, editor and manager. Daily and weekly editions will be published.

The Ohio Screen Plate Company has been organized in Hamilton, Ohio, by Willard Howcroft and James Watson, formerly of the Totowa Screen Plate Company, of Paterson, N. J. The business of the company will consist of reclosing and recutting screen plates for paper mills.

Failures.

H. L. Steed, bookseller and stationer, Box Elder, Utah, has made an assignment.

The stock of J. C. Klein & Co., wholesale paper dealers, Easton, Pa., has been sold at sheriff's sale for $2,931.

Henry H. Pryor, receiver of the Rochester Paper Company, Rochester, N. Y., in the suit of Charles S. Hastings against the company, gives notice that he will sell uncollected accounts and personal property of the company on December 3, at 10 A. M., at his office in that city.

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; T. D., trust deed, and Real, a mortgage on real estate.]

EASTERN STATES.

Mortgagor.	*Amount.*
John J. O'Callaghan (*Bunker Hill Times*), Boston, Mass.	$2,700
Powell & Co., Cambridge, Mass.	1,000
George W. Prescott, Quincy, Mass.	2,000

MIDDLE STATES.

J. F. Hall, Batavia, N. Y. (Real)	1,500
M. M. Suter, Brooklyn, N. Y.	800
Hinkley & Co., Buffalo, N. Y. (B. S.)	1,000
Hinkley & Co., Buffalo, N. Y.	420
W. J. Bantham (Bantham, Fowkes & Co.), Utica, N. Y.	180

WESTERN STATES.

W. H. Jacobs, Arbuckle, Cal	500
C. C. Purinton, Boone, Ia.	2,500
McIvor & Shafer, Hoxie, Kan. (R.)	600
I. Golmis (Vesper & Golmis), Topeka, Kan.	300
Ida A. Adams, Allegan, Mich. (R.)	3,718
John R. Wood, Detroit, Mich.	2,575
Renno Muehlen (*Post*), Grand Rapids, Mich.	150
Gustaf A. Seipel, Duluth, Minn.	200
Sherman & Cutright (*Journal*), Plattsmouth, Neb.	550
Rogers & Reinecke (*Herald*), Schuyler, Neb.	315
Light of Truth Publishing Company, Cincinnati, Ohio	35,000
Slater & Brelsford, Dayton, Ohio	880
Rounds Printing Company, Salt Lake City, Utah	300

SOUTHERN STATES.

C. E. Duval, Pineville, Mo.	162

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL, FRIDAY, November 30, 1894.

THE MONEY MARKET.—The stock market was dull, and most of the moving shares closed at lower figures. The loan market was dull and steady. Call loans at the Stock Exchange were made at 1@1½ per cent., the higher rate for small loans. For time contracts the inquiry is light. The offerings are moderate. Rates remain 1½ per cent. for thirty days, 2½ for sixty days to four months, and 3 per cent. for five to six months on good Stock Exchange collateral. Foreign bankers offer freely. Commercial paper quotations are 2¼@3 per cent. for sixty to ninety day indorsed bills receivable; 3@3½ per cent. for four month's commission house and prime four months' single names; 3½@4 per cent. for prime six months' and 4½@7 per cent. for good four to six months' single names. The supply of paper is small, and all the choice lines sell quickly. Bankers still talk of higher rates. The market was firmer on a decreasing supply of commercial bills and covering by bankers. Posted rates were $4.87 for sixty days and $4.88½ for sight. Actual rates were $4.86¼@4.86¼ for sixty days and $4.87¼@4.88 for sight.

THE PAPER TRADE.—The week, broken by a holiday, has not developed anything very startling in the paper trade. There is a fair all round business, and the mills as a rule are fairly well supplied with orders. Prices do not show any improvement, however, and in some lines there is a tendency to pinch closer, especially on some low grade Book papers.

JUTE BUTTS.—The Butt market is unchanged. Some Butts were destroyed in a Brooklyn storehouse which was burned this week.

WOOD PULP.—The market is in the same condition as when last reviewed, there being a steady demand at regular prices.

WOOD FIBRE.—The demand for Chemical Fibre continues to grow, and there is a small all round gain. Domestic Soda is quoted at 2¾@3c. for Bleached, and 2½c. for Unbleached. Domestic Sulphite is quoted at 1¾@2⅜c., as to quality, for Unbleached, and 3½c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 2.60@2.75c.; Bleached, same process, 3½@3.90c.; Unbleached, sulphite process, 2.50@3.15c.; Bleached, do., 3.85@4¼c.; Bleached Straw Pulp, 3.80c. This week there were imported at this port 260 tons of Chemical Fibre, being 210 tons from Copenhagen, 35 tons from Genoa and 15 tons from Stettin.

FOREIGN RAGS AND PAPER STOCK.—There is some inquiry for foreign rags, but it is not of large proportions, and the resulting sales are not important as a rule. We note sale 100 tons New Colored Cottons to arrive at 1¾c., and 50 tons New White Shirt Cuttings at p. t. Imports for the week aggregated 3,100 bales and 260 tons, being 744 bs. rags, 23 bs. papers, 260 tons chemical fibre and 2,333 bs. manillas. Ports of shipment and quantities are as follows: Copenhagen, 40 bs. rags, 210 tons chemical fibre, 98 bs. manillas; Genoa, 100 bs. rags, 35 tons chemical fibre; Glasgow, 24 bs. rags; Hull, 182 bs. manillas; Liverpool, 123 bs. rags, 1,775 bs. manillas; London, 155 bs. rags, 23 bs. papers, 143 bs. manillas; Rotterdam, 302 bs. rags, 135 bs. manillas; Stettin, 15 tons chemical fibre.

DOMESTIC RAGS.—Orders are sufficient to keep packings moving, in a very fair way, so that there are no important accumulations. Prices vary very little.

BAGGING, &C.—The market for Gunny Bagging is quiet and prices are about as last week, 1.05c. being quoted for shipment. Imports of manilla stock for the week aggregated 2,333 bales, being 98 bs. from Copenhagen, 182 bs. from Hull, 1,775 bs. from Liverpool, 143 bs. from London and 135 bs. from Rotterdam.

OLD PAPERS.—Old papers are having a very fair amount of attention. We quote: No. 1 Hard White Shavings, 2½@2⅝c.; No. 1 Soft White do., strictly free from wood, 2.15c.; Soft White do., ordinary, 1⅞@2c.; Old Ledgers, 2c.; Solid Printed Books, 1¼c.; Mixed Shavings, No. 1, 1@1½c.; Mixed Shavings, No. 2, ¾c.; Extra No. 1 Manillas, 90c.; No. 1 Manillas, ordinary, 75c.; No. 2 Manillas, 60c.; Light Book Stock, 60c.; Folded News, 35c.; Mixed Papers, 35c.; Commons, 25@30c.; Straw Clippings, 45c.; Binders' do., 45c.

STRAW.—The market is quiet and without change. We quote: Long Rye at 50@55c.; Short Rye at 40@45c.; Wheat at 40c.; Oat at 35@45c.

ROSINS.—For lower grades the market is firm at quotations. Pale grades are nominal. We quote: Common to Good Strained, $1.55@1.65; E, $1.75; F, $1.90; G, $2.10; H, $2.20@2.25; I, $2.60@2.65; K, $2.85@2.90; M, $3.20; N, $3.35; W G, $3.55@3.60.

CHEMICALS.—The market for paper makers' chemicals shows a steady improvement. Late advices as to English markets speak as follows: "Chemicals of the staple description are still marked only by weakness alone, the weakness being, if anything, more pronounced. Bleaching Powder, Caustic Soda and Soda Crystals are all fractionally lower in price, and buyers seem more and more inclined to wait on the chance of a marked lowering of value as governing the contracts for the new year, when these are entered into. Chief prices current are: Soda Crystals, 38s. to 39s., Tyne; Soda Ash, 48-52°, £3 17s. 6d. to £4 5s. net, Tyne; White Alkali, 48-52°, £4 10s. to £5 5s., Tyne; Alum in lump, £5 10s., Glasgow; Caustic Soda, white, 74°, £9 10s., 70-72°, £8 10s., 60-62°, £7 10s., and Cream, 60-62°, £7 7s. 6d., all net, Liverpool; Bleaching Powder, £7 7s. 6d." In the local market Bleaching Powder is in better demand, and contracts for 1895 have been sold quite freely. Sal Soda is moving more actively. Caustic Soda is strong on spot and Alkali has advanced. During the week there have been sales 50 cks. Bleach at 1.85c.; 25 tons Soda Ash at 1⅛c.; Caustic Soda, 70 per cent., at 2.30c. and 74 per cent. at 2.32½c.

CHINA CLAY.—China clay shows no improvement this month over its condition during October. However the usual volume continues, with ordinary strength, and the trade is a fair jobbing one, with prices steady and unchanged.

TWINES.—There is a very fair volume of business and prices are regular. We quote: Sisal Hay Rope, 5@6c.; Sisal Lath Yarn, fine, 9¼c., and medium, 9c.; Jute Lines, 7½c.; Jute Ready, 7@7½c.; New Zealand Hay Rope, 6¼@7¼c.; New Zealand Lath Yarn, fine, 9¼c.; medium, 8¼c. Twines—Hemp, 4½ and 6 B Russia, 12c.; 4½ and 6 A American, 12c.; 4½ and 6 D Jute, 9½c.; 4½ and 6 L Jute, 9c.; Hemp Ball, 18 B C, 17c.; 18 C, 15c.; Russian Hemp Hay Rope, 9c.

COAL.—Soft coal is yet very irregular, but the production of Anthracite has been restricted in an effort to bring about better prices.

EDWIN BUTTERWORTH & CO.,
MANCHESTER ENGLAND,
PACKERS OF ALL KINDS OF
Paper Stock, Cotton Waste and Buffalo Sizing, Wood Pulp, Moist and Air Dry Pulp, Soda and Ground Pulp,
83 GUNNY BAGGING, &c.
OFFICE IN NEW YORK:
Vanderbilt Building, No. 132 Nassau Street,
JAMES FIRNIE, A. S. DEMAREST, } Managers.

WATERBURY
Felts and Jackets,
MANUFACTURED BY
H. WATERBURY & SONS CO.,
ORISKANY, N. Y.
Adapted to *every* grade of paper, from the *finest* to the *coarsest*.
The Largest Manufacturers of Paper Makers' Felts in the World.
Our wet machine or pulp felts are *unequaled* for *durability*.
For WRITING and LEDGER PAPERS We warrant a felt equal to anything imported.

PRICES CURRENT.

NEW YORK MARKET.

Paper Market.

DEALERS' SELLING PRICES.

Ledger and Record	$0.18	@	$0.24
Flat Caps, superfines	14	@	16
Flat Caps, fines	11½	@	13
Flat Caps, engine sized	7½	@	9
Blotting, American	8	@	15
Blotting, English	17	@	....
Book, super sized and calendered	6	@	9
Book, super sized and tinted	6	@	7½
Book, extra machine finish	5½	@	6
Book, machine finish, low grade	5	@	5½
News, No. 1	4	@	4½
News, rag and wood	3	@	3½
Poster	5	@	7
Hanging, superfine, No. 1	8	@	10
Hanging, superfine, No. 2	6	@	8
Hanging, machine satin	4	@	4½
Hanging, white blank, No. 1	4	@	4½
Hanging, curtain	3½	@	4
Hanging, brown	2½	@	3
Colored papers, double mediums	6½	@	8
Colored papers, glazed medium	7½	@	8½
Colored papers, tobacco	8½	@	9½
Colored papers, tissues, 20×30, ℔ ream	1.10	@	1.35
Tissues, black, 20×30, ℔ ream	1.40	@	1.50
White tissue, 20×30, ℔ ream	85	@	1.00
White tissue, 24×36, ℔ ream	1.35	@	1.50
Manillas, Flour sack, cream	10½	@	....
Manillas, Flour sack, drab	9½	@	11
Manillas, Rope, unbleached No. 1	9½	@	11
Manillas, Rope, unbleached No. 2	7½	@	9
Manillas, No. 1, light weight	6½	@	6½
Manillas, No. 1, heavy weight	6½	@	6½
Manillas, No. 2	5	@	6
Manillas, Bogus	2½	@	3½
Wrapping Parchment	16	@	....
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	75	@	80
Hardware, light colored, No. 1	9	@	10
Hardware, No. 1, glazed, tarred	7	@	8
Hardware, No. 1, glazed	4½	@	5
Binders' Boards, ℔ ton, No. 1	70.00	@	90.00
Binders' Boards, ℔ ton, No. 2	40.00	@	50.00
Strawboards, air dried, No. 1, ℔ ton	f. 47.50	@	....
Strawboards, steam dried, No. 1, ℔ ton f. o. b. mill		....	@24.00
Straw Wrapping, basis, 15×20, 15½ lbs., 20 sheets—			
36×40, from 36 to 42 lbs. ℔ rm	72	@	....
30×40, from 30 to 34 lbs. ℔ rm	....	@	60
24×36, from 24 to 26 lbs. ℔ rm	....	@	50
22×32, from 24 to 26 lbs. ℔ rm	50	@	....
20×30, 21 lbs., ℔ rm	....	@	44
20×30, from 14 to 17 lbs. ℔ rm	30	@	....
16×22, from 12 to 13 lbs. ℔ rm	25	@	....
18×28	....	@	12
15×20, 10 lbs. ℔ rm	....	@	18
15×20, from 7 to 8½ lbs. ℔ rm	....	@	15
14×18	....	@	12
12×16	....	@	11
11×15	....	@	10
Straw Wrapping, ℔ lb., heavy weight	1.75	@	1.85
Straw Wrapping, ℔ lb., light weight	1¾	@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00	@	30.00
Tea Papers, 16 sheet quires—			
12×18	....	@	15
14×20	....	@	18
Card Middles, ground wood	5½	@	6¾
Card Middles, long fibre wood	8½	@	9
Card Middles, rag and wood	6	@	9
Pulp Lined Boards, single manilla, No. 100 and heavier	42.50	@	....
Pulp Lined Boards, double manilla, No. 100 and heavier	47.50	@	....

Chemicals, Coloring Materials, &c.

Alkali, 58 ℔ cent	....	@	1.20
Alum, lump	1.65	@	....
Alum, ground	1.75	@	....
Alum, Keystone	1½	@	2
Alum, Diamond	....	@	2½
Alum, pearl	2½	@	2¾
Alum, porous	2½	@	2¾
Alum, Merrimac porous	2	@	....
Aluminous Cake	....	@	1¾
Anti-Chlorine	....	@	2¼
Bichromate Potash, American	....	@	10
Bleaching Powders, spot	....	@	1¾
Cambridge Ochre	11.25	@	....
Caustic Soda, 60 ℔ cent	2.20	@	2.30
Clay, China, English, ℔ ton	12.50	@	17.00
Clay, China, "Star"	12.50	@	....
Clay, China, "Keystone"	10.75	@	....
Clay, South Carolina, ℔ ton	9.50	@	10.00
Clay, Terra Alba, French, ℔ cwt	1.00	@	1.12½
Clay, Terra Alba, American, No. 1	95	@	1.00
Corn Starch	3	@	3½
Copperas, American	....	@	80
Extract Logwood	9½	@	....
Mineral Pulp	10.25	@	....
Orange Mineral	....	@	9½
Potato Starch	4½	@	4¾
Prussian Blue, dry	20	@	35
Prussiate Potash, American	....	@	24½
Rosins, common to good strained, ℔ bbl	1.55	@	1.65
Rosins, E, ℔ bbl	1.75	@	....
Rosins, F, ℔ bbl	....	@	1.90
Rosins, G, ℔ bbl	2.10	@	....
Rosins, H, ℔ bbl	2.20	@	2.25
Rosins, I, ℔ bbl	2.60	@	2.65
Rosins, K, ℔ bbl	2.85	@	2.90
Rosins, M, ℔ bbl	....	@	3.30
Rosins, N, ℔ bbl	....	@	3.35
Rosins, W G, ℔ bbl	3.55	@	3.60
Sal Soda	1.10	@	....
Soda Ash Caustic, 48 ℔ cent	1.60	@	1.65
Soda Ash, carbonated, 48 ℔ cent	1.57½	@	1.70
Soluble Blue	40	@	55
Spanish Brown	½	@	1
Sugar Lead, white	12	@	....
Sugar Lead, brown	7	@	....
Sulphate of Alumina	....	@	2½
Sulphuric Acid, 66 ℔ cent	1	@	1½
Ultramarine, blue	14	@	17½
Venetian Red	1	@	1½
Vitriol, blue	5½	@	5¾
Yellow Ochre Rochelle	1.35	@	1.50

Wants and For Sale.

Twenty-five words or less, one dollar each insertion. Over twenty-five words, four cents a word each insertion, up to eighty words. Cash should accompany order.

Over eighty words, or displayed advertising, will be charged for by the inch, according to our regular schedule of rates.

Answers can come in our care and will be promptly forwarded without extra charge.

WANTED—A SITUATION TO RUN FOURdrinier machine or engines: large experience; am temperate; good reference. MACHINE TENDER. Box 386, Newmarket, N. H.

WANTED—A ONE MACHINE PAPER MILL, either 62, 74 or 86 inch, with machine suitable to make machine finished book; must be in good running order: near Boston or New York. Address WILSON, care Paper Trade Journal, 67 Federal street, Boston.

WANTED - POSITION AS REPRESENTATIVE of reliable mill making either fine papers or book, for New York, or might include Boston and Philadelphia; large trade acquaintance. ALAN, Box 2816, New York.

WANTED—DRAUGHTSMAN AND MACHINist, age twenty-eight, wants situation as superintendent of machinery and repairs or as machine shop foreman. Address STEADY, care of this paper.

FINISHER—AMERICAN, SOBER AND steady, wants situation on book, news and manilla; ten years' experience; good references from last employer, E. A. CHIPMAN, Woodfords, Me.

A SALESMAN AND GENERAL OFFICE MAN of twenty-five years' experience, energetic, capable and reliable, and accustomed to handling specialties, desires to represent a manufacturer; large acquaintance North and South among jobbers and retail stationers, hardware, housefurnishing and department stores, &c.; A1 references. Address J. E. M., care Paper Trade Journal.

PAPER RULER, GERMAN, COMPETENT IN all branches, desires position. Address T. L. 10, care of Paper Trade Journal.

WANTED—POSITION AS FIRST-CLASS cylinder machine tender, or will take charge of mill; best of reference. Address G., care Journal.

WANTED—FIRST-CLASS FOURDRINIER machine tender to run wide machine on book papers; good situation for thoroughly competent and reliable man. Address A., care of Paper Trade Journal.

WANTED—A FIRST-CLASS FOREMAN FOR a large roofing and sheathing mill; must have experience in that class of paper; must be a No. 1 man in every respect. With full particulars address FELT, care of Paper Trade Journal.

WANTED—SITUATION TO RUN STEAM engine in paper mill; many years' experience; can furnish best references. Address H. W. LUTHER, 105 Elm Street, Charlestown, Mass.

WANTED—POSITION AS SUPERINTENDENT by a first-class paper maker; very best references. Address HUDSON, care of Paper Trade Journal.

SITUATIONS WANTED BY FIRST-CLASS superintendents, machine tenders and engineers; worked on all grades of paper; both slow and fast running machines; can furnish best references if required. Apply to EAGLE LODGE No. 1, Brotherhood of Paper Makers, Box 672, Holyoke, Mass.

WANTED

$250,000 to start a wood pulp mill in one of the best places in Canada. Extensive water power and over 300 square miles of timber limits; best facilities for shipping and low freights. Probable dividends 10 to 15 per cent. Product of mills to be sold in England. Money secured on land and mills. Correspondence solicited.

J. H. LEFEBVRE,
136 St. James St., Montreal, Canada.

WANTED

By a thoroughly equipped general foundry and machine works, some specialty to manufacture in the machinery line; heavy machinery preferred; familiar with paper machinery. Address NATIONAL, care Paper Trade Journal.

SITUATION WANTED,

By young married man, as boss in color department; understands mixing colors for fine colored, white plated and chromo papers, enameled and glazed, ivories and satins for lithograph, bristols, boxboards and wedding cards; can give good reference. Apply to COLOR MIXER,
Post Office Box 818, Holyoke, Mass.

FOR SALE—A 58 INCH RIGHT-HAND Findlay paper cutter; as good as new. ADAMS & CO., Chagrin Falls, Ohio.

FOR SALE.

Two diaphragm screens, each for six plates, 12x40x5-16 inches, heavy and strong, entirely new; have never been out of shop.

THE BLACK & CLAWSON CO.,
Hamilton, Ohio.

PAPER MILL MACHINERY.

One 82 inch Fourdrinier machine complete, with gun metal press rolls; nine 36x78 inch dryers; stack of chilled rolls; reel, cone pulley cutter; Marshall driving train; made in 1887 and used three years.

One 76 inch Fourdrinier machine which takes 42 foot wire; gun metal press rolls; nine 48x72 inch face dryers; heavy stack chilled rolls; reel, cutter and Manning winder. Both machines set up as last used.

One 70 inch Fourdrinier, which takes 33 foot wire; gun metal press rolls; twelve 28x66 inch dryers; of stack chilled calender rolls; reel and cutter.

One 54 inch cylinder machine; two molds, vat, first and second presses; seven iron dryers, 28x54 inch face; new revolving reel; new cone pulley cutter; machine set up as last used.

Two new Jones double lighter beating and washing engines; iron rolls 52 inch face and 60 inches diameter.

One new Jones double lighter beating and washing engine; iron roll 52 inches diameter and 52 inch face.

Eight (Holyoke Machine Co.'s make) 1,000 pound beaters; 48 inch iron rolls; new tubs; bars in excellent condition.

Six (Holyoke Machine Co.'s make) roll beaters; tubs in fair condition; rolls 42x42 inches.

Two good tub beaters in excellent condition; iron rolls 40x40 inches.

Two iron tub beaters with iron rolls, 36 inch face.

Three Jordan refining engines, newly filled; practically as good as new.

One practically new 7x20 foot rotary boiler.

Two 6x20 foot rotary boilers.

One 14x42 foot Corliss automatic steam engine.

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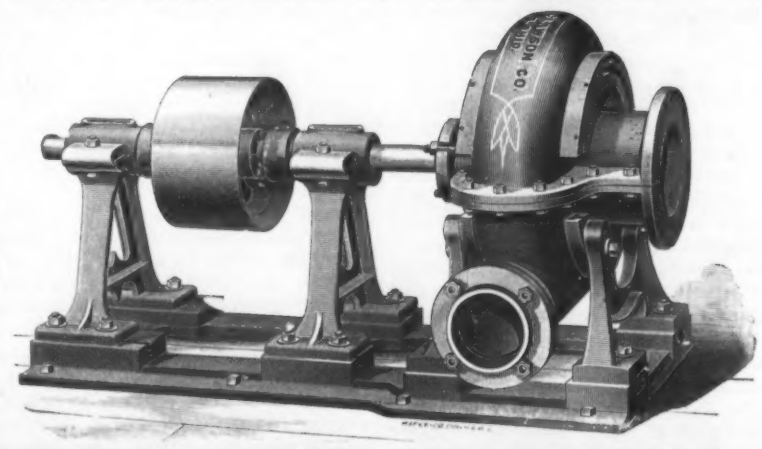
F. H. DAVIS & CO., Exchange B'd'g, Boston, Mass.

THE BLACK & CLAWSON CO., MANUFACTURERS OF Paper Mill Machinery,



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HARPER IMPROVED FOURDRINIER AND CYLINDER MACHINERY.

JORDAN ENGINES.

Jordan Engines Refilled.

Screens, Calenders, Rag Cutters, Cylinder Molds, Deckel Straps, Paper Cutters, Screen Plates, Dandy Rolls, Stuff Box Trucks, Iron and Brass Castings.

REVOLVING REELS AND STACK REELS.

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THE BLACK & CLAWSON CO., Hamilton, Ohio.

WE MAKE THE ONLY PERFECT DRYER.

MEDAL AWARDED AT WORLD'S FAIR FOR OUR SEAMLESS DRYER.

FOR SALE.

A set of six 88 inch revolving reels, new, our make, with heavy frames, gears, tension wheels, endwise adjustment, driven by weighted friction, a power rotating attachment and a reel turning device.

THE BLACK & CLAWSON CO.,
Hamilton, Ohio.

Hofmann's Treatise on Paper Making.

Two second-hand copies in first-class condition will be sold at a sacrifice. Desire to dispose of same at once. Address

SACRIFICE,
Care Journal.

TO LEASE.

The Hanmer & Forbes Company's Manilla Mill.

BURNSIDE, Conn., April 10, 1894.

C. F. HANMER, Secretary.

PAPER MILL

For Sale or Rent.

ADDRESS

JOHN A. DUSHANE,
44 South Charles Street, Baltimore, Md.

NOTICE.

My attention having been called to the fact that certain parties are infringing certain Letters Patent granted to me, to wit: No. 212,866, dated March 4, 1879, covering a new form of carpet lining, and No. 235,698, dated December 21, 1880, covering the method of and apparatus for making the same, this is to notify all such persons, whether manufacturers or dealers, that any infringement of either of said patents will be prosecuted to the full extent of the law. MOSES NEWTON, Patentee.

FOR SALE.

Two second-hand Jordans.
One Marshall Engine.
Two Rotaries, 6 x 20 ft.
Two Daniels Rag Cutters.
Two Revolving Paper Cutters.
All guaranteed in good condition; nearly new.

NOBLE & FOSS MACHINE CO.,
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TEAMING,

Transferring & Forwarding.

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Room 23, 53 River Street,

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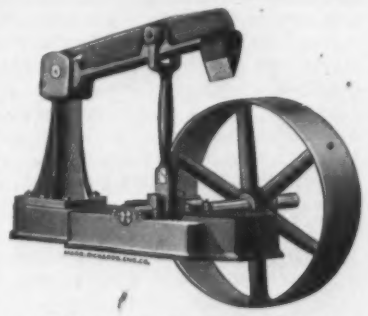
Consignments of Car Lots for City Distribution or Reshipment solicited.

RATES FURNISHED TO ALL POINTS.



C. A. LAWTON,

DE PERE, WIS.,

Manufacturer of Barkers, Splitters and Saws for Pulp Mills. Shafting and Pulleys a Specialty.

Write for Prices.

PROVIDENCE STATIONERY CO.

WHOLESALE DEALERS IN

Paper and Twine,

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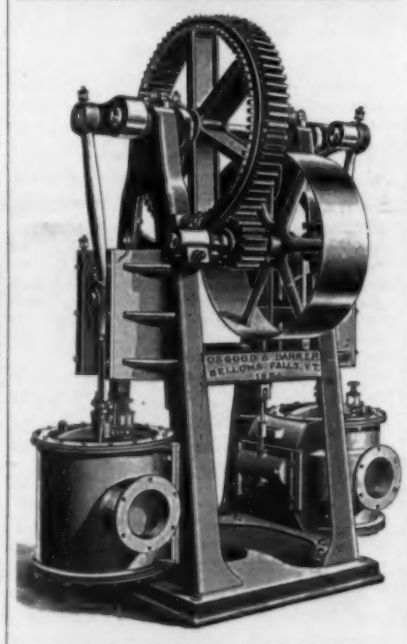

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Fourdrinier and Cylinder Paper Machines,

With one, two, three or four stacks of dryers.

Upright Reels, with two or three Drums,
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For buffing ends of the rolls.

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For all kinds of Paper.

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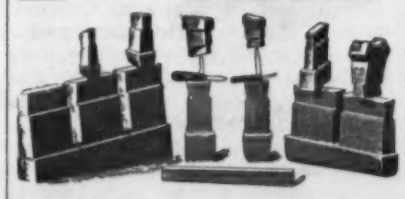

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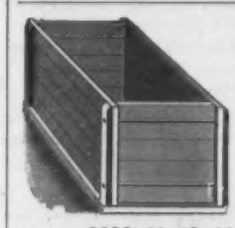

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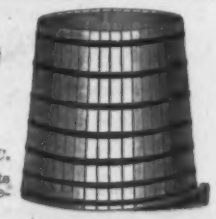
In sending for estimates state if measurements are inside or outside and thickness of wood desired.



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Also Cardboard and Paper Hangings Machinery. Hilbers, Staib and Waldron Patent Hanging Up Machines. Patent Power Reeling Machines for Coated Papers and Cardboard. Embossing Machines, Paper Rolls, Polishing Machines, &c.

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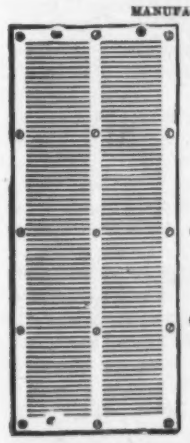

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A SPECIALTY.

OLD AND NEW WORK.

CENTRAL SCREEN PLATE WORKS,

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Three Different Machines

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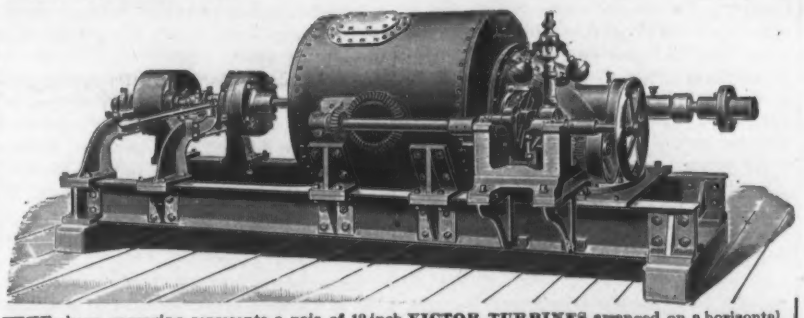
CAUTION.

All persons are liable to prosecution who make buy or use Paper Testers that confine and break paper within its edges, as my Patents cover that method.

THE VICTOR TURBINE.

UPRIGHT or HORIZONTAL.



THE above engraving represents a pair of 12 inch VICTOR TURBINES arranged on a horizontal shaft, with Cast Iron Flume, Draft Tubes, End Bearings for Shaft, and Driving Pulleys complete, all mounted upon a substantial cast iron bed plate. The entire arrangement is very complete and strictly first class in every particular. We are now prepared to furnish Victor Turbines, either single or in pairs, on horizontal shafts, and where the situation admits of their use we recommend them.

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SIZE WHEEL.	HEAD IN FEET.	HORSE POWER.	PER CENT. OF USEFUL EFFECT
15 inch	18.06	30.17	.8932
17½ inch	17.96	36.35	.8930
20 inch	18.21	45.00	.8582
25 inch	17.90	68.62	.8584
30 inch	11.65	52.54	.8676
35 inch	17.29	133.19	.8497
40 inch	16.49	148.93	.8253
48 inch	15.51	179.29	.8203

CYLINDER OR REGISTER ***GATE.***

INSURING HIGHEST PERCENTAGE OF USEFUL EFFECT AT

FULL AND PARTIAL GATE.

Such results, together with its nicely working gate and simple, strong and durable construction, should favorably commend it to the attention of all discriminating purchasers.

THESE WHEELS ARE OF VERY SUPERIOR WORKMANSHIP AND FINISH.

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Screen Plate Co.,

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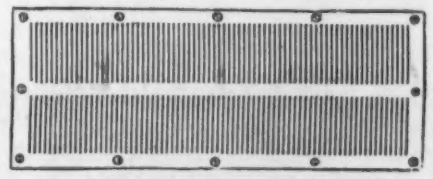

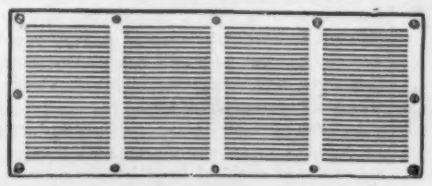

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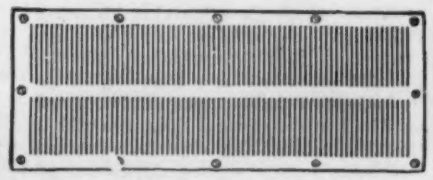

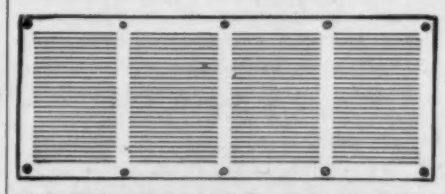

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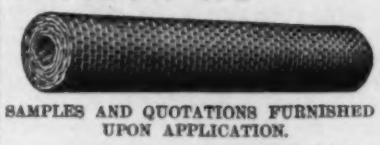
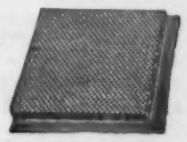


SAMPLES AND QUOTATIONS FURNISHED UPON APPLICATION.



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Asbestos Prepared Roofings.

(Specially adapted to Paper Mills).

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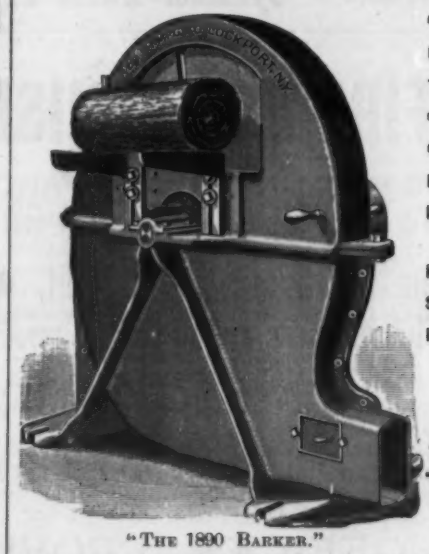
TREVOR MANUFACTURING CO., LOCKPORT, N. Y.

MANUFACTURERS OF

IMPROVED WOOD PULP MACHINERY.



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"Niagara" Grinders,

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Double and Triple Plunger Pumps, for general use in Pulp and Paper Mills.

Write for Catalogue C and Discounts Address

Trevor Manufacturing Co.,

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EXCELSIOR BOILER FEEDER

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Watson Jet Pump.

FOR Stationary, Marine and Locomotive USE.

For simplicity and durability it has no equal. It is not automatic, but it has had the severest test, and it has been used extensively on Traction Engines, Dredging Machinery and Boats, and the current of water is not broken by the motion of water or a great jar, consequently it has overcome this difficulty, without the use of valves or sliding tubes used by the automatic. It being used by many of the largest Engine Manufacturers in the States for two or three years is evidence of its merits. A trial solicited. Send for Price Lists and Discounts.

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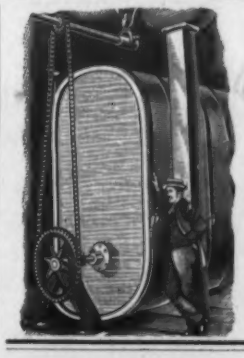

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Fits into a narrow space and requires but little power to operate.

It has a double agitating motion, moving the stuff in different directions, which prevents "floating."

It empties itself clean; no waste of stuff and protects from dirt.

Quantity of stuff in chest always shown by indicator.

In writing give space in height, length and breadth if pressed for room; also the amount of stock in dry paper that the chest is wanted to hold.

PATENTED AND MANUFACTURED BY

E. L. SAVAGE, Mechanic Falls, Me.

FOSTER & BROWN, SACCARAPPA, MAINE.

MACHINISTS AND IRON FOUNDERS.

SPECIALTIES:

Improved Paper-Coating Machines; Hanging Machines and Power Reels for Coated Paper; the Merrill-Foster Noiseless Pulp Screens; Paper Slitting and Trimming Machines; Hardened and Ground Slitters; Automatic Elevators.

BUILT UNDER OUR OWN SUPERVISION.

THE "WANDEL"

Rotary Sulphite Pulp Strainer,

PATENTED IN THE UNITED STATES AND CANADA.

And Now Used in the Following Mills:

38	Pulp Mills	in	Germany,
9	"	"	Austria,
5	"	"	Switzerland,
7	"	"	France,
1	"	"	Italy,
1	"	"	Spain,
2	"	"	England,
13	"	"	Norway and Sweden,
3	"	"	Denmark,
1	"	"	Finland,
6	"	"	Russia.

ADVANTAGES: Largest straining surface, combined with small requirement of room. Unsurpassed straining capacity. Absolutely reliable and noiseless work. No contact of the pulp with iron parts. Practical construction. Simple, durable, perfect. Price very moderate.

THE "WANDEL" ROTARY SULPHITE PULP STRAINER

Is the only system now adopted by the most important Sulphite Fibre Mills of Europe.

FOR FURTHER PARTICULARS APPLY TO

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Paper Machinery.

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BEATING ENGINE.

IMPROVED MACHINES FOR MAKING SQUARE PAPER BAGS.

By our PATENT methods of obtaining slack paper, severing bag lengths and applying paste, we are enabled to make perfect bags at a speed not attained by any other machine on the market. For full information and prices address

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Price, Two Dollars a Copy,

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It enables manufacturers, buyers and sellers to come together for mutual benefit.

The book includes a list of Paper Makers in the United States, Canada and Mexico; Wholesale and Retail Stationers, Paper Dealers; Leading Printers, Lithographers, Book Publishers, Bookbinders, Wall Paper Printers; Blank Book, Paper Bag, Paper Box, Envelope, Pad and Tablet Manufacturers; Railroad Buyers, &c., in the United States.

Orders filled according to date of receipt. Address

HOWARD LOCKWOOD & CO.,

126 & 128 Duane St., New York.

Manufacturing News.

EASTERN STATES.

The Bodwell Water Power Company is negotiating for the building of a pulp and paper mill at Milford, Me.

The Windsor Locks Machine Company, Windsor Locks, Conn., is building its fifth Jordan for the Hudson River Water Power and Paper Company, of Mechanicsville, N. Y. These Jordans are said to be the largest ever made, being 54 inches long, 48 inches in diameter at the large and 24 inches in diameter at the small end, having a capacity of 1 ton an hour.

F. R. Walker & Son, Burnside, Conn., are enlarging their old machine by putting on new dryers and calenders to enable them to make tub sized paper.

The Crowell Manufacturing Company will build a paper mill at Rockport, Mass.

The Anchor Mill, Windsor Locks, Conn., shut down on the evening of November 20 to put in a new main gear at the water wheel.

The new paper mill at Glastonbury, Conn., is not yet ready to start up, there being a delay in getting its machine.

The Cushnoc Fibre Company, Augusta, Me., will put another machine in its mill to run on manillas.

One of the machines of the Fall Mountain Paper Company, Bellows Falls, Vt., is reported to have recently run off a sheet of paper 85 inches wide and over 85 miles long.

The Nashua River Paper Company, East Pepperell, Mass., is adding another story to its bleach room. The loss by the partial burning of the mill of the Westminster Paper Company, Bellows Falls, N. Y., on November 21 was $30,000; fully covered by insurance. The mill will be rebuilt at once, enlarged and improved.

MIDDLE STATES.

The Hudson River Water Power and Paper Company, Mechanicsville, N. Y., is making extensive improvements to its plant, including putting in two new machines and several Jordan engines.

The Analomink Paper Company, Minsi, Pa., which started up about six weeks ago, is running full time on blank book papers.

The mill of the Uhlersville Paper Mill Company, Raubsville, Pa., which has been idle for several months, was started up on November 24.

A machine has been devised by R. W. Moncrieff, Dundee, Pa., for the purpose of making paper of the quality and with all the characteristics of hand made paper. It is now in regular use at the Rush Paper Mills, near Northampton, Pa.

A branch line from the Chateaugay Railroad is being run to connect with the new pulp mill at Freydenburgh Falls, N. Y.

The Brandywine Mills, West Chester, Pa., which have been idle for some time, are to be started up and will be run on manillas.

There was quite a ceremony in starting up the new Hanover Mill, Whippany, N. J., on November 17. A number of ladies and gentlemen were present, and "Old Glory" was raised above the mill at the signal of the steam whistle. The dimensions of the different departments of the mill are as follows: Machine room, 180x60 feet; beating engine room, 110x60 feet; engine room, 50x60 feet; stock house, 40x50 feet; rotary room, 40x50 feet; finished stock room, 50x200 feet. There is a compound Corliss engine, 300 horse power, with a 42-inch stroke and an 18-inch cylinder. The main driving wheel is 14 feet in diameter, 25½ inch face. There are two turbine water wheels, 100 horse power each; three auxiliary engines for pumping pulp, supplying boilers, &c., and for fire purposes, the latter with the necessary amount of hose to reach to all parts of the building; chimney 100 feet high, 12 feet diameter at base; two steam boilers of 125 horse power each, one rotary boiler. The machine makes a box board 84 inches wide, and has a daily capacity of about 20 tons. The mill stands on the site of the old cotton factory and was built by days' work under the supervision of McEwan Brothers from plans and drawings made by Richard McEwan. The Caledonian Mill, 12 tons daily capacity, at Whippany, is also under the management of this firm. The water rights include over 1½ miles of the Whippany River, with two dams and two raceways.

The Wendler Machine Company, Carthage, N. Y., recently made the following shipments of its special machines for the manufacture of pulp. One new design chip crusher to the Richards Paper Company, South Gardiner, Me.; one "Standard" 72-inch wet machine to the Cumberland Paper Company, Cumberland, Md.; one wood splitter to the Katahdin Pulp and Paper Company, Lincoln, Me., and one to C. R. Remington & Son, Watertown, N. Y.; one patent rotary screen for sulphite pulp to the Hudson River Pulp and Paper Company, Palmer Falls, N. Y.; a centrifugal pressure pump to C. R. Remington & Son, Brownville, N. Y., and one to the E. B. Eddy Company, Hull, Canada; one barker to the New England Fibre Company, Turners Falls, Mass.; one centrifugal fan pump to the Racquette River Paper Company, Potsdam, N. Y.; and one 20,000 gallon acid plant complete to the Hudson River Water Power and Paper Company, Mechanicsville, N. Y.

WESTERN STATES.

The mills of the Hennepin Paper Company, Little Falls, Minn., were shut down last Sunday to put in "New American" turbines, one a 42 inch and the other a 30 inch special. This will give the company nine wheels and 1,200 horse power. A new pulp grinder will be put in, increasing the capacity of the pulp mill about one-fourth.

The Riverside Paper Company, West Carrollton, Ohio, has purchased from M. M. Solomon a fraction of the 10 acre tract of land at the southwest corner of Kedzie avenue and Thirty-first street, Chicago, comprising between 3 and 5 acres, at $3,200 an acre. J. H. Friend, of the George H. Friend Paper Company, is president of the purchasing company, which has a capital stock of $50,000, and R. W. Burns is the secretary. It is the intention of the company to erect a factory and manufacture tablets and writing paper, the partially manufactured material to be shipped from West Carrollton to the Chicago factory, where it will be finished and marketed. J. B. Pride, of Appleton, Wis., is the architect for the new factory. It will be two stories high, of brick, steel and stone, and will cost $25,000.

On November 12 the steamer Utopia took 366 cases of paper, weighing 219,472 pounds, from the mill of the Puget Sound Pulp and Paper Company, Everett, Wash., to Vancouver, B. C., where it was reshipped by the steamer Miowera, of the Canadian-Australian line, to parties in Melbourne and Sydney, Australia; Brisbane, Queensland, and Auckland, New Zealand.

The Beloit Iron Works, Beloit, Wis., are having a very gratifying sale of the noiseless "Leader" screen, brought out about eight months ago. They have sold forty-eight, all of which are giving satisfaction, running on all grades of stock from ground wood to writing, and many of them have replaced other heretofore prominent screens. In designing and constructing this screen the manufacturers have carefully studied all others now on the market, with a view of eliminating all defects and objectionable features, and to produce a screen which will run right along without constant tinkering. Their experience thus far seems to prove this has been accomplished. The screen requires very little power and only an ordinary foundation. Although general business has been in a deplorable condition, the Beloit Iron Works also report a very satisfactory year of work in the paper machinery line, having built one 118 inch strawboard machine, one 110 inch Fourdrinier, besides numerous orders for their late pattern cutters, wet machines, water pumps, stuff pumps, &c.

The paper mill at Ellicott City, Md., recently leased by Meyers & Frank, is receiving a thorough overhauling. A part of the paper making machinery has been renewed, and an additional dam has been constructed to supply water for washing purposes.

CANADA.

John Pugsley has purchased the building and plant of the Napanee, Ont., Pulp and Paper Company, both at Napanee and Fenelon Falls, and after extending and improving the properties will recommence operations. A new bleaching house is being erected at the falls now.

The new paper mill which the E. B. Eddy Company has been fitting up at Hull will be completed and ready to begin work by January 1. The machinery is now being placed in position, but the full equipment of the establishment, which is designed more particularly for the manufacture of paper bags, will take some time. The paper bag factory will be of the very best in the country and furnished with the latest machinery.

Fires.

The Keystone Fibre Company, manufacturer of indurated fibre ware, East Stroudsburg, Pa., has been burned out. Loss, $25,000; partly insured.

In Town.

G. W. Russell, Lawrence, Mass.; Frank Gilbert, Troy, N. Y.; F. W. Spicer, Dexter, N. Y.; Stanton Day, Solon, Me.; Charles G. Price, Minsi, Pa.

Personals.

Chas. R. Keeney, of Keeney Brothers, Manchester, Conn., has been very seriously ill for two weeks with typhoid fever, but is now doing very nicely and is quite comfortable.

WANTED—A SECOND-HAND PAPER CUTter, 48 inch or larger. BROWN & CLARK PAPER CO., No. 316 North Third Street, St. Louis, Mo.

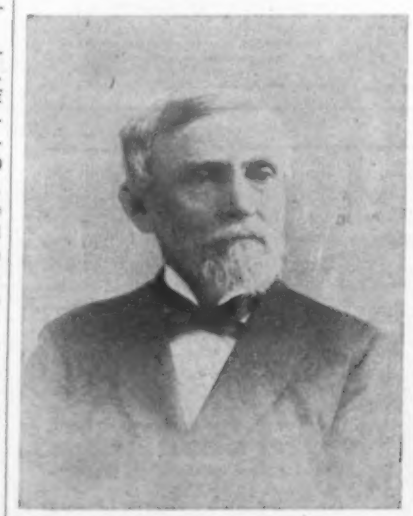
Obituary.

CHARLES S. KENDALL.

Charles S. Kendall, of the Rice-Kendall Company, Boston, died on Tuesday morning, November 27, at Augusta, Ga.

Mr. Kendall had been in poor health for two or three years, and a month ago went with members of his family to Augusta, hoping for improvement. He had reached the ripe age of eighty-two years, and his death was not unexpected.

Mr. Kendall was born in Boston, Mass., January 9, 1813, his father, John Kendall, dying when Charles was ten years of age. At the age of fifteen the latter was graduated from the Mayhew School in his native city as one of the medal scholars of his class.



CHARLES S. KENDALL.

His school days over, he entered the employ of Pierce & Williams, a leading firm of booksellers in Cornhill, where he remained until he became of legal age. About that time, his health failing, he went South and after a few months' sojourn there returned to Boston and became a partner in a firm organized to succeed the old house of Lincoln & Edmunds, then just going out of business. The new firm organized under the name of Gould, Kendall & Lincoln, which became at once a prominent name in the literary history of Boston, it being the leading Boston publishing house of that day.

About 1850 Mr. Kendall retired from the publishing house and became interested in the firm of Wilkins, Carter & Co., paper dealers, of Boston, in which firm the Hon. Alexander H. Rice was a partner. A few years later Charles S. Kendall, with Mr. Rice, organized the house of Rice & Kendall, which afterward became Rice, Kendall & Co., a firm name which for a generation has stood foremost among the leading paper jobbing firms of the country.

About three years ago the firm became incorporated under the name of the Rice-Kendall Company, Charles S. Kendall being vice-president and holding that office until his decease.

Mr. Kendall was a man of singular simplicity of character and of great personal integrity. He was a thorough Bostonian, very proud of the city and its institutions, and greatly interested in everything that affected its reputation or welfare. He was a prominent member of the Baptist denomination, and connected with the Clarendon Street Church.

He never sought nor held public office, but as a citizen was honored and respected wherever known.

Mr. Kendall was twice married, and leaves a widow and three children, two daughters and a son, Charles S. Kendall, who was associated with him in business.

C. W. FLODQVIST.

C. W. Flodqvist, the eminent Swedish engineer, died at Stockholm, Sweden, on October 18.

Mr. Flodqvist was born on March 17, 1847. He studied engineering at the Royal Technical College in Stockholm, and passed his examination in 1867. In 1868 he was appointed technical director in a large paper and mechanical pulp mill having five paper machines and thirty-six grinding stones, where he remained till 1884.

In 1880 he constructed his first sulphite pulp mill, having six boilers, with a capacity of 2 tons each. These boilers were revolving, and specially constructed for the injection of direct steam. After 1884 he worked his patent on his own account, and constructed mills in Sweden at Forsbacka, Stömne, Brusafors, Habo, Wargön, Mackmyra, Thurbo and Hjerpen.

Recently he was engaged in constructing new mills at Forshaga and at Uddeholm. He also built three mills in Norway, two of which are the well known Bohnsdalen and Gjorvik mills, one in Finland, two in Russia, one in Germany, two in Bohemia and one in France, making a total of twenty-one mills.

E. S. Hamlin, founder of the Cleveland (Ohio) *Leader*, and probably the first free soil editor in the country, died recently in Washington, D. C., at the age of eighty-six.

Edward Maynard, a salesman for C. F. Hubbs, New York, died suddenly on Monday last from a stroke of paralysis. Mr. Maynard was at one time a manufacturer of tassels and fringes, but during the war began to sell paper for the then firm of Manahan & Millar, now G. W. Millar & Co., and has since that time remained in the trade. He possessed some inventive genius, among his inventions being a cork jacket and rope with a cork core, which enabled it to float when thrown overboard.

Accidents.

John McDonald, an employee in the Botsford Paper Mill, Otsego, Mich., fell into a vat of boiling pulp on November 24, and died shortly after being taken out.

Edward Underwood, a young employee of the Falulah Paper Company, Fitchburg, Mass., had his right hand badly lacerated on November 17. He was wiping some rapidly revolving calender rolls when his hand was drawn in by the catching of a bit of waste and the flesh was almost completely torn from the palm and wrist. The attending physician said that it was the worst wound of the kind he had ever seen, and expressed some doubt about its healing.

General Notes.

There has recently been deposited in the Patent Office Museum at Washington a facsimile copy of what is believed to be the first patent for an invention issued in America. The subject of the patent was a water wheel, and it was granted to Joseph Jenkes by the General Court in Boston, March 6, 1646.

The Purcell Envelope Company, Holyoke, Mass., has made arrangements with the Plimpton Manufacturing Company, Hartford, Conn., to manufacture the envelopes called for in its contract with the Government. It is understood that this will not conflict with contracts entered into with the Connecticut River Paper Company.

Jas. H. Manning, F. C. Manning, John A. Delahanty and Daniel Lamont have sold their stock in the *Argus* Company, Albany, N. Y., to Wm. McMurtrie Speer—and it is said that the offer made to Messrs. Manning and Russ by the Plimpton Manufacturing Company to purchase their interest in the Purcell Envelope Company has been accepted.

What is said to be the most dangerous counterfeit that has appeared in many years is an imitation of the Windom $2 silver certificate. Chief Hazen, of the United States Secret Service, has issued a detailed warning to the public, in which he says the note will bear the closest scrutiny. The counterfeit is being circulated in the large cities principally.

Six copies of THE CHEMISTRY OF PAPER MAKING were ordered and shipped to paper manufacturers in England during the past week. Several orders were also filled in this country. The book is selling rapidly both here and abroad. The last half of the first edition is now being disposed of. The second edition will be promptly placed on the market when necessary.

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Liquefaction in Steam Cylinders.

The value of a theory lies principally in its capacity for practical use. If the theory does not work in practice it may be interesting or amusing or scientific, but its commercial value is necessarily very small. There are plenty of examples available which prove quite as conclusively that exceedingly economical engines are at work which are not jacketed, and furthermore, that in these engines turning steam into the jackets did not make them more economical, but less so. How can this be? What is the explanation of the fact? The *Engineer*, London, says that there is no satisfactory explanation available, and yet the circumstance is one of value and importance. It affects every theory of the steam engine; it is radical; it goes to the very root of the whole matter. Until a satisfactory explanation is forthcoming there can be no theory of the steam engine framed worth the paper on which it is written. There is only one fact which appears to be able to help in any way to a right conclusion. It is that in all the highly economical engines in which a jacket does no good there is next to no compression in the cylinder, the leading corner of the diagram being almost a right angle.

As matters stand at present there is a very consistent theory of the steam engine, which is that a certain proportion of the steam admitted per stroke is expended in heating up the cylinder in the first instance during the admission period, and is subsequently re-evaporated mainly during the exhaust period, and never does any work whatever on the piston, or at all events very little. In what direction are we to search for the solution of the problem? The first point to be considered is this: On what does the power of the metal to condense steam depend? Obviously on its capacity for taking up heat. Can it be shown that two different pieces of cast iron vary in this respect? Has the nature of the surface of the metal any influence? It was suggested not long since that a surface of metal dead smooth would be a worse absorber of heat than a rough surface. Inquiries on this point lead to negative results. In highly economical engines no attempt has been made to polish the insides of cylinder covers or piston faces; indeed, in all cases it is known that these parts soon become dull and coated with a thin layer of grease and dirt brought over by the steam.

On the other hand, it has been proved that by putting plenty of oil into a cylinder condensation is diminished, just as it is by a jacket; and also that a thin coat of varnish has the same effect. The quantity of metal affected and affecting is in any case so very thin that it is nearly, so to speak, all surface, and it would almost appear that it is to some relation between the character of the surface and the steam that we must look ultimately for the solution of the problem; but when we have reached this conclusion we have advanced but a very little way. Then we have the remarkable fact that the efficiency of cylinder metal as a condenser is appallingly phenomenal. It is far superior in this respect to the brass tubes of a surface condenser, through which cold water is flowing; furthermore, it appears to be largely independent of difference in temperature. At all events, whether the range of temperature within a cylinder is large or small, the condensation seems to be about the same.

One point claims further investigation: What is the relation existing between the quality of the steam used and the amount of cylinder condensation? It has been shown that the most disastrous results as regards economy are obtained by permitting a tablespoonful or so of water to remain in a cylinder. It is well known that under certain circumstances pumping engines will not "come indoors" to the full length of the stroke if any water is allowed to remain in the cylinder. Now, is it not possible that the key to the anomalies presented by steam engines in practice is to be found in the dryness or wetness of the steam? Is it not possible that much of the water said to enter the cylinder in the form of steam really enters it as water? We have a conviction that a great deal of so called dry steam is not dry at all, and that the much vaunted salt test is of no value whatever. Not long since a case came up in which the traps on a row of steam pipes delivered enormous quantities of water. These pipes were very carefully clothed.

According to all existing data on the subject the condensation due to radiation could not have produced one-tenth of the water coming from the traps. It amounted to from 12 to 14 per cent. of the feed water. Tests were made in the usual way with the balanced water barrel, hose and thermometer. These over and over again gave 10 to 12 per cent. of water in the steam. Then the salt test was tried, and it showed that the amount of priming was less than a fraction of 1 per cent. The first thing, it seems to us, to be done in all engine trials of whatever kind, is to ascertain the percentage of water entering the engine with the steam. It would also be useful to ascertain the percentage of water in the exhaust steam on its way to the condenser. Any water received from the boiler as such will find its way to the condenser as water. It will be augmented in quantity by the liquefaction due to the performance of work and to radiation, but the results obtained from the exhaust pipe would serve as a very useful check on those got from the steam pipe.

Tests of Automatic Fire Sprinkler Heads.

Prof. D. S. Jacobus, of Stevens Institute of Technology, presents a valuable paper on tests of automatic fire sprinkler heads, in the last issue of the *Stevens Indicator*. Some ten years ago the New York Board of Fire Underwriters submitted several automatic fire sprinkler heads to President Morton for comparative tests, and since that time all the sprinkler heads and their systems which have been considered by the board have been tested by Professor Jacobus. The present paper gives the results of these trials and describes not only the methods of testing, but also the principal characteristics which a reliable head should possess.

Fire extinguishing systems employing automatic sprinkler heads are of two kinds, the "dry pipe" and the "wet pipe." In the former there is no water in the pipes until the sprinkler head is released by the action of heat and thereby operates a valve admitting water to the piping. The object of this construction is to prevent freezing in the pipes leading to the heads. An important disadvantage of this system is that the water is longer in reaching the fire than in a wet pipe system. In some large plants the time required for the water to travel from the main valve to the head is from one to five minutes, according to the location of the head. In the wet pipe system the water flows upon the fire at the instant of the release of the head. The heads in the dry pipe system are generally placed in an upright position above the pipe, in order that all water may be drained from the system. If they were placed in a pendent position a small quantity might be left in the head and cause trouble by freezing. In the other method the heads are usually placed in a pendent position, in which they are just as efficient as when placed upright, and the piping may be hung against the ceiling.

When sprinkler heads are subjected to long continued use the following defects may be developed: The valve may stick in the seat after the fusible solder releasing device has fallen apart and released the valve; the releasing device may not fall apart after the fusible solder has melted, so that the valve will not be released; the heads may open of their own accord. Sticking was first noticed when gutta percha washers were used, this material in some cases becoming so firmly cemented against the seat that the sprinkler would not open at ordinary pressures. Similar defects were found when a lead washer was used against a brass seat. The reliability of the head was increased when a copper disk was introduced between the lead washer and the valve face. Sticking at the valve seat must be especially guarded against, since if a sprinkler on the top floor of a building is subjected to a pressure of, say, 8 pounds per square inch, the pressure on the valve will be about 1½ pound, as the nozzles of many sprinkler heads are about half an inch in diameter. A small amount of corrosion will often be sufficient to overcome this low pressure.

The failure of the releasing device was developed in heads relying in a great measure on the elasticity of the brass frame, or other stiff brass pieces, to operate the releasing device. In some heads tested the force acting on the valve could be adjusted so that no leakage would occur at 40 pounds pressure per square inch, and yet this force would not be sufficient to operate the releasing device after the fusible solder had melted. A head of this kind operates perfectly when new, but not when it has been subjected to the strain for a long time. Opening without the application of heat has been found to be a most serious defect in several forms of heads.

The tests were made to ascertain the following: Reliability of action and sensitiveness; distribution and rate of flow in the open air and under flat and joisted ceilings; durability, in which the sprinklers are connected to short pipes which are filled with water. These tests are made in order to note if the releasing device will open of its own accord and to determine if corrosion will cause the valve to stick. Professor Jacobus states that the main feature of a sprinkler head is that it shall operate with certainty in case of fire. To test this point the sprinklers are heated in an oven and the reliability of action noted at the same time that the sensitiveness is determined. Another test consists in applying a flame at intervals directly to the heads in order to imitate the effect of a sudden fire where there are drafts of air. This is done with a gas burner that gives a large heating flame, completely enveloping the head. This test is stated to be a severe one, and sprinklers that will open correctly in an oven will sometimes fail when subjected to it. The main cause of failure in this case is the "starting" of the solder joint sufficiently to permit leaking in such a way as to cool the solder joint and prevent further opening.

The requirements of the New York Board of Fire Underwriters are that with 10 feet water head the distribution 8 feet below the sprinkler head shall be over a circle at least 10 feet in diameter, that the diameter 6 inches above shall be 8 feet or over when tested in the open air, and that the rate of flow shall be at least 1 cubic foot per minute. Sprinklers that distribute the water umbrella fashion or in streams are not reliable. The best form of delivery is in large drops over the entire area, large drops being disturbed less than mist or spray, which a light draft may change the direction of. In the durability tests the sprinkler heads are mounted as in practice and their action noted at long intervals of time.

Chimney Draught.

It is generally supposed that the draught of chimneys is due solely, or almost so, to the expanding of the inclosed heated air in the chimney, thereby giving it a buoyant or ascensional power, which is known as draught. But, unfortunately for this theory, we find a decided draught in chimneys without heat or fire passing through them.

The fact is as to draughts, like electricity, we know very little as to their cause and effect, independently of the fact that all the technical journals are profuse in formulæ to show the amount of work produced by electricity and draught respectively. Should one ask an engineer versed in electricity or draught from the mechanical standpoint what produces the phenomena, if he is candid he will frankly admit he does not know.

A gentleman of high standing in electrical engineering, when asked to define electricity replied that he did not know, but it was produced in one way by revolving at a high velocity a coil of wire in space, and combing, as it were, the electricity from the surrounding atmosphere. Rather a romantic answer, but one which, in a way, defines the operation.

As to draught in chimneys, although applied in the arts for over 1,800 years, yet no one can say with certainty how it is produced. If anyone will look over the transactions of the mechanical engineering societies and read the discussions on chimney draught, they will be surprised at the differences of opinion expressed by the learned men who have discussed the subject. But there is one fact as to which there can be no doubt, namely, that to produce a good draught in any chimney the height of the chimney is an essential factor for the economic combustion of fuel.

The draught power of chimneys is dependent on their area of cross section and height, other things being equal. The ordinary tables and formulæ for dimensions of chimneys for various horse powers of boilers is based on the following assumed or asserted data:

1. The draught power varies as the square root of the height.

2. The power varies directly as the area of the shaft.

Boiler makers as a rule assume the above to be correct. Now as to the facts in practice. The draught power being based on the above and the tables deduced therefrom, a chimney 48 inches in diameter and 150 feet high would be only sufficient for 425 horse power boilers, whereas the writer has actually produced 1,000 horse power (based on 30 pounds of water evaporation) by a chimney of the above dimensions, and proposes to add a 200 horse power boiler as soon as may be required.

I cite the above to show the fallacy of all the formulæ as to draught power of chimneys. It is assumed according to the above rule that their height should be eight times the area of the chimney; the quality or kind of fuel is not stated.

The important factor, grate surface, depends on the different kinds of fuel used and the conditions under which the fuel is burned; again, the tables are also based on a temperature in the chimney of 600°, a very high temperature, it would seem, having in view proper economy. The intensity of degree of heat evolved by the fuel varies in proportion to the rate at which it burns; the greater the draught is, the greater the amount of work which will be produced from the same fuel. The power of draught is directly proportional to the height of the chimney, and the velocity with which the external air flows in to supply the draught depends upon the temperature of the ascending gases. The higher the temperature is the lighter will be the gases, which consequently will create a stronger draught.

That there is draught in a chimney without fire no one will deny. In a great many chimneys the infiltration of air through the masonry has, no doubt, a great influence to retard the velocity of the heated gases, when in use. The intensity of draught is independent of the area, and depends upon the difference between the inside and outside temperatures; the degree of heat produced by the fuel varies in proportion to the rate at which it burns; the greater the draught is, the greater amount of work that will be produced from the same fuel. This goes to show the importance of tall chimneys; therefore, the power of draught is directly proportional to the height of the chimney, and the velocity with which the external air flows in to supply the draught depends upon the temperature of the ascending gases.

Air at 520° temperature expands to double its volume at 32°; therefore, the higher the temperature is the lighter will be the gases, which, consequently, will create a stronger draught.

A rapid draught is, in one respect, equivalent to a large fire grate area, since it enables more fuel to be burned in a given time, and thus increases the power of the boiler in generating steam. A rapid draught, however, has this advantage, that, inasmuch as the temperature of the furnace is higher when the same quantity of heat is generated in a small space than it will be when generated in a large space, the heat is transmitted much more rapidly to the water in the boiler in the case of the strong draught, by reason of the higher temperature thus obtained. The manufacturing requirements of modern times demand the building of high chimneys, so as to enable more fuel to be burned in a given space and time, and thus increase the power of the boiler.

The present fad of having a very short or low chimney in connection with a fan or blower for exciting the fire is a mistake, and as to its first cost there is no saving over a high, well proportioned chimney. The former system, too, has the disadvantage of involving continual expense to keep it in good running order, independent of its deterioration of the boilers. Again, the former plan causes the delivery of the heated gases in the lower stratum of air, whereby it is wafted into the surrounding dwellings along with the smoke and fine particles of carbon, which of course is very objectionable.—*W. Barnet Le Van in Machinery.*

Pitting of Boilers.

In an article recently published, M. Olroy, a French engineer, gives the result of his investigation into the pitting of boilers. Pitting is particularly likely to occur if a water very free from lime is used in a clean boiler. The pits take the form of conical, or more frequently spherical, depressions, which are filled with a yellowish brown deposit, consisting mainly of iron oxide. The volume of the powder is greater than that of the metal oxidized, so that a blister is formed above the pit which has a skin as thin as an egg shell. This skin contains usually both iron oxide and lime salts, and differs greatly in toughness. In many cases it is so friable that it breaks with the least shock, falling to powder, while in other cases the blister detaches itself from the plate as a whole.

An analysis of the powder in the pits showed it to consist of 86.26 per cent. of peroxide of iron, 6.29 per cent. of grease and other organic matter and 4.25 per cent. of lime salts, the remainder being water, silica, aluminum, &c. The skin over the pits was found to contain 38 parts of calcium carbonate, 12.8 parts of calcium sulphate and 32.2 parts of iron oxide, with about 8 per cent. each of magnesium carbonate and insoluble matter. Feed heaters often suffer badly from pitting, particularly near the cold water inlet, and in boilers the parts most likely to be attacked are those where the circulation is bad, especially if such portions are also near the feed inlet. In locomotives the bottom of the barrel is most frequently attacked, and the largest ring. The steam spaces are generally free from pitting unless the boiler is frequently kept standing with water in it. As the water evaporates pitting is likely to occur along the region of the water line, a part which in a working boiler is generally free from attack. This is especially the case if longitudinal joints of the boiler are liable to be exposed by the evaporation of the water and to form a ledge on which moisture can rest.

When a boiler forms one of a battery and is kept standing for a long interval, the top of the boiler is liable to pitting. Steam finds its way into it and condenses on the roof, causing bad pitting there. Perfectly pure water containing no air does no harm, and steam alone will not cause pitting unless it gets a supply of air. The Loch Katrine water of Glasgow, which causes pitting on clean boilers, contains much gas. MM. Scheurer-Kestner and Meunier-Dolfus inclosed a polished iron bar in a natural water containing much oxygen and no lime salts. The bar gradually rusted, but the corrosion ceased when the oxygen was used up. The bar was then removed, repolished and put back, after which it remained perfectly bright. Repeating the experiment with water containing lime the rusting was much less complete, the lime salts forming a protective layer on the iron; but on polishing this off corrosion recommenced. In distilled water the bar remained quite bright. The corrosion is much more rapid if the water contains carbonic acid gas as well as oxygen. In this case a voltaic action takes place. The rust first formed is electropositive to the iron, which then dissolves away, decomposing the water. It is for this reason that in cases of pitting it is essential that all traces of the iron peroxide should be cleaned from the metal or the rusting will continue.—*Iron Age.*

Expansion of Factory Chimneys.

It does not often happen that facilities are afforded for exact measurements to be made of the expansion and contraction of a factory chimney. It is generally admitted that boiler chimney shafts should not be attached to the walls of any important building, on account of the risk of cracking the walls by the expansion of the heated brickwork, but it is not very easy to obtain reliable information respecting the amount of such expansion, and some persons have doubts whether brickwork really expands or contracts when heated.

An unusual opportunity of making measurements on this point has recently occurred at Newcastle-upon-Tyne. The boiler chimney of the college was erected five years ago, and has been in constant use during the interval. As originally constructed it stood alone, 60 feet from the college building, 99 feet high from the concrete foundation and 90 feet from the ground level. To the height of 33 feet from the ground an internal firebrick flue was constructed with an air space of 3 inches between it and the shaft. The upper 57 feet of the shaft was built of stock brick only, and had a uniform diameter of 6 feet 2 inches externally, while the internal flue increased from 3 feet 11 inches to 4 feet 8 inches in diameter, the strictly cylindrical character of the exterior giving the chimney the appearance, when looked at from a distance of 50 yards or more, of being trumpet shaped, and larger at the top than at the bottom. During the last few months a casing of ornamental brickwork has been erected around the chimney, but independently of it, so that the casing of the shaft forms one of four octagonal turrets surrounding the Royal Jubilee Exhibition Tower and guarding the principle entrance to the college quadrangle. The near completion of the brickwork surrounding the chimney afforded the opportunity of observing from the top of the casing any movement of expansion or contraction of the chimney itself.

As the boiler fires are generally drawn or allowed to die out on Saturday afternoon and relighted on Monday morning, the chimney has an opportunity of cooling down about forty hours, and observations made from the top of the casing wall showed a contraction of the chimney of 5 millimetres, or 2 inches, during that time. As the surrounding wall was still about 6 feet below the top of the chimney when the measurements were made, and as the first 33 feet of the shaft remained practically cold on account of the air space between it and the centre flue, it may be taken that the length of brickwork in which the expansion took place was about 50 feet. According to this a shaft 100 feet high should expand 4 inches when in use. The measurement was only of a preliminary character, made for the purpose of determining whether it would be safe to allow the decorative work at the top of the turret to rest partly on the outer casing and partly on the internal flue, and the result showed conclusively the desirability of keeping the chimney shaft entirely independent of any other structure.

A number of prominent business men and bankers, representing Baltimore's commercial and financial institutions, met at the Corn and Flour Exchange at Baltimore on November 26, to discuss the Nicaragua Canal problem. The call for the meeting stated that it is of the greatest importance that the United States Government shall finish the canal and have absolute control over it. This sentiment prevailed at the meeting. It was stated, however, that should Government aid not be forthcoming, private capital should be subscribed and the canal finished. The Corn and Flour Exchange committee has been in correspondence with the leading exchanges and boards of trade of the United States and is assured of active support from them. The associations will be asked to arrange for public meetings throughout the country and committees will be sent to Washington to lay the matter before Congress.

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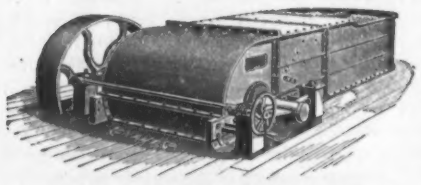

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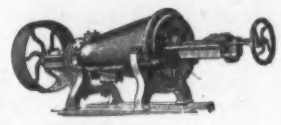

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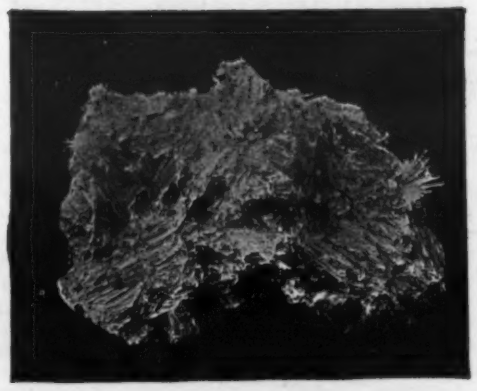

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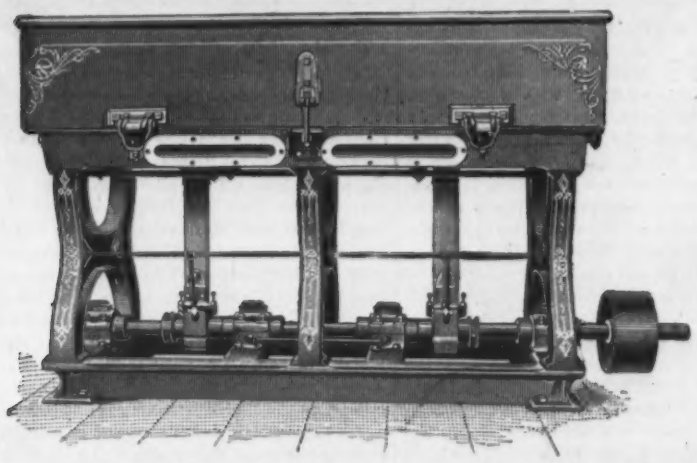

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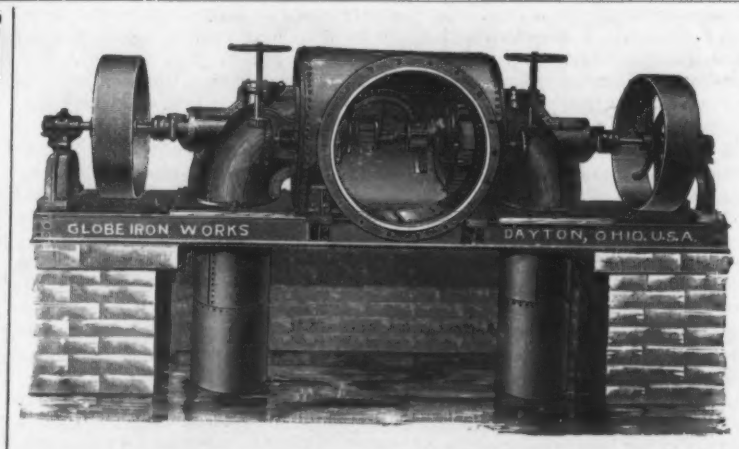

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Whole Gate,	16.06	119.17	141.58	205.27	79.76
⅞ "	16.42	122.00	127.18	195.19	82.58
¾ "	16.78	117.33	112.60	175.74	82.18
⅝ "	17.03	111.33	98.12	149.99	79.31
½ "	16.88	118.67	82.07	118.40	75.52

TEST OF A 42 INCH WHEEL—JULY 14, 1894.

	Head.	Rev. per Min.	Cu. Ft. per Sec.	Horse Power.	Per Cent.
Whole Gate,	16.33	138.00	134.18	199.56	80.50
⅞ "	16.56	134.80	120.85	188.14	83.09
¾ "	16.59	129.33	104.85	162.89	82.77
⅝ "	17.13	125.25	92.76	142.40	79.21
½ "	17.48	121.00	70.80	98.85	70.60

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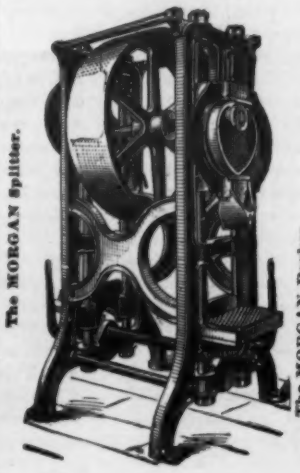
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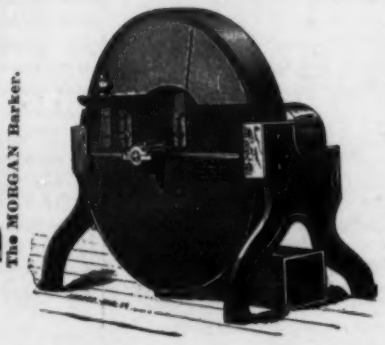
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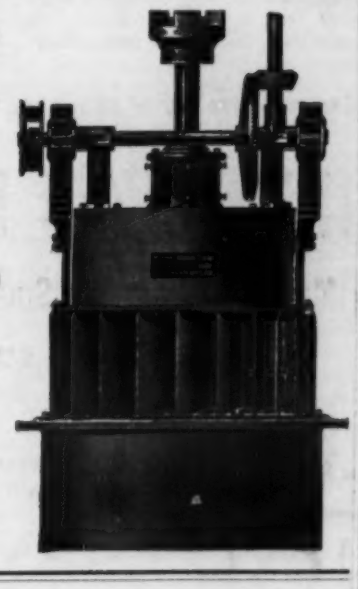

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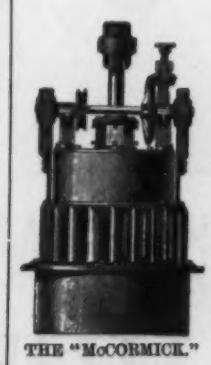
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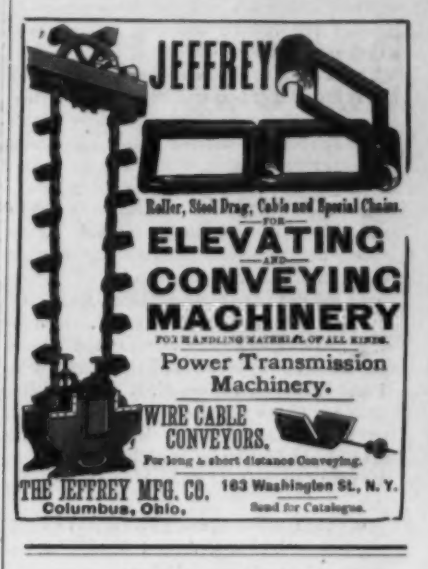
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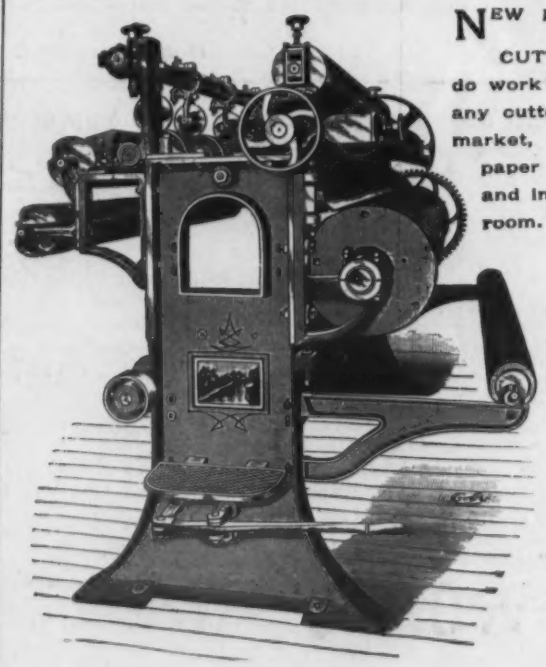

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Suction Box for Paper Machines.

An improved suction box is herewith illustrated, Figure 1 being a section of the box longitudinally of the travel of the wire on the line *x x* of Fig. 3; Fig. 2 a sectional view on the line *y—y* of Fig. 3, illustrating the relation of the head block and rubber of flexible traveling heads with reference to each other and to the rolls; Fig. 3 a plan of the box, the wire and the retaining leathers and plates being removed; Fig. 4 a longitudinal section through the box at right angles to the line of travel of the wire, and taken on the section *z z* of Fig. 3; Fig. 5 a fragmental plan of one end of the box with the retaining leathers and with the retaining plate in position; Fig. 6 a fragmental section which illustrates the position of the retaining plate with reference to the head blocks and rolls; Fig. 7 a side elevation of one of the head blocks; Fig. 8 an end elevation of one of the head blocks, and Fig. 9 a top view of the same.

This suction box is arranged for the formation of an air tight chamber below the mold or wire, of which suction chamber the pulp on the mold or wire with the deckel straps (not shown) constitute the top of the chamber. The mold or wire A and the deckel straps are of usual construction.

The rectangular box B, of substantially the form illustrated, forms the inclosing case for the suction box. Inside of the ends of this rectangular box B are placed boards or partitions, C, C', which form the ends of the suction box proper. Between the partitions C and C' and the ends of the box B are placed blocks, D and D', upon which are seated journal boxes, E, in which turn the axes F, F, and F', F', of the rollers G, G'. The axes F, F and F', F', pass through bores (not shown) in the partitions C and C'. To the inside of the partitions C and C' are placed head blocks H and H' of the form illustrated by Figs. 7, 8 and 9. These blocks consist of an upright piece, *h*, having curved sides, *h'*, to fit against the periphery of the rolls G and G', and the cross piece *h'* having the curved ends *h'''* to fit against the hubs *g* and *g'* of the rollers G and G'. The cross pieces *h''* of the head blocks H are placed against the partitions C and C', and rubber or flexible heads I and I' encircle the hubs *g* and *g'* of the rollers G and G', and the cross piece *h''* of the head blocks H and H', as illustrated.

The rubber or flexible traveling heads fill in the space the full depth of the hubs *g* and *g'* of the rollers G and G', and fill up the entire space between the upright parts *h* of the head blocks H and H' and the partitions C and C'. The upright pieces *h* of the head blocks prevent the flexible traveling heads from being drawn inwardly on their upper lap, and the cross pieces *h''* prevent the flexible traveling heads from sagging on their upper lap.

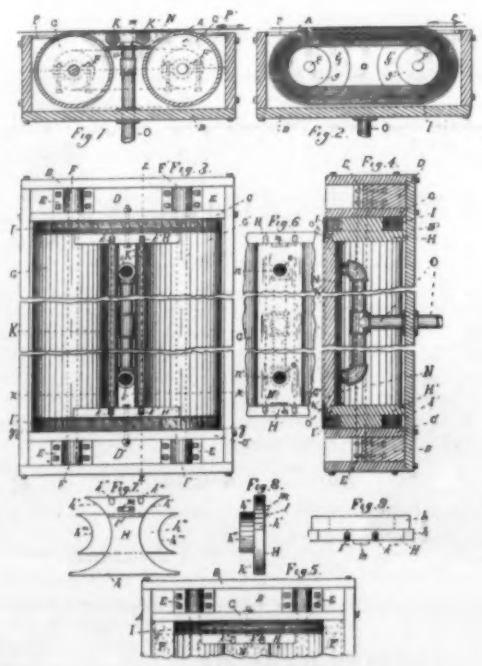
The wire A with its deckels (not shown) forms an air tight connection with the rubber or flexible traveling heads I and I', and these rubber or flexible traveling heads close tightly the ends of the vaccum chamber and prevent the passage of air and water therethrough. The partitions C and C' being placed against the outer ends of the hubs *g* and *g'* of the rollers G, G' the rubber or flexible traveling heads I, I' fill the space between the ends of the rollers G, G' and the partitions, as illustrated. Rollers K, K', having axles *k*, *k'*, are carried in journals *k''* in the upper face of the head blocks H and H'. The rollers K, K' may be dispensed with as well as the retaining plate hereinafter described, in which case the head blocks H may be modified by dispensing with the upright part *h*, using only the part *h'*.

On the inside of the head blocks H and H' are fastened cleats, *l*, and blocks, *m*, between which are placed the retaining plate N. The retaining plate N has two openings, *n*, *n'*, through which projects the open ends *o*, *o'* of the T headed suction pipe O.

The suction pipe O enters through the bottom of the rectangular box B, as illustrated, and is connected in any suitable manner with vacuum pumps. The open ends *o*, *o'* of the T headed suction pipe O should be as near as practicable to the under side of the wire A without coming in contact therewith.

To the top of the rectangular box B, along each of its sides, are fastened retaining levers, P and P', which have their outer edges fastened to the top edge of the rectangular box B and their inner edges resting upon the rollers G, G'. The wire A with the pulp thereon rests upon the upper sides of the rollers G and G', forming an air tight connection therewith; and the rollers K and K' support the wire between said rollers and prevent its sagging. The ends of the vacuum chamber are formed by the rubber or flexible traveling heads I and I' and the head blocks H and H', and the sides of the vacuum chamber are formed by the rollers G and G', while the top of the vacuum chamber is formed by the pulp carried by the wire A. When a vacuum is created beneath the wire A by means of vacuum pumps through the vacuum pipe O, the air pressure forces the wire A with the pulp thereon into intimate contact with the rubber or flexible traveling heads I and I' and the rollers G and G'.

The box B is preferably partly filled and



SUCTION BOX.

kept constantly supplied with water from any convenient source, and the level of the water in the rectangular box B will be maintained at any suitable point in any well. known manner while the machine is in operation.

The object of the retaining leathers P and P' is to prevent air pressure upon the water below the plates from forcing the water up between the rollers G and G' and being carried away through the suction pipe O; and the object of the retaining plate N is to resist the tendency of water to rise to the openings *o*, *o'* of the suction pipe O within the vacuum chamber.

The rollers G, G' are represented in the drawings as cylinders. They are so represented because being made of metal this construction makes them lighter.

It will readily be understood that when connection is opened with the vacuum pumps a vacuum will be created in the air tight chamber and that the water and moisture in the pump lying on the surface of the wire or mold will be extracted as the wire passes over the vacuum chamber.

Steam Supply Pipes.

There has been given a great deal of advice—good, bad and indifferent—about the choice and management of the engine, but the important question of the supply pipe is too little considered. This, in view of the fact that the performance of the engine may be badly handicapped by the proportions or arrangement of the steam pipe and its accessories, is surprising—not more so, perhaps, than the indifference as to chimneys shown in connection with boilers and their settings, but sufficiently so.

While there can be no hard and fast rules laid down as to the length, diameter, straightness, material, position, &c., of the supply pipe, there can be some general laws laid down—pointing to ideals which it would be well to realize as nearly as possible without sacrificing more cash outlay, or steam, or safety, or convenience, than is gained.

As regards the length, there can hardly be two opinions—the shorter the better, other things being equal. By this I do not mean that the engine should be put right in the boiler room, where it would get cut up with cinders, merely to get a short steam pipe; nor do I mean that the entire shafting and transmission of the establishment shall be complicated or made inconvenient, merely to save a few feet or even a few lengths of supply pipe; but the line should be as short as is practicable without sacrificing something more important to obtain close coupling. The amount of condensation in the line is very nearly directly as the length of pipe—that is, with double the steam pipe length, other things being equal, there will be double the condensation between the boiler and the steam chest.

Straightness of line contributes to steam economy and to low first cost and high safety in two ways—by lessening pipe length and by avoiding elbows, particularly reverse angles or Z's. I have seen establishments where sooner than make a horizontal diagonal line from the boiler to the steam chest, the pipe was given two right-angled bends, with of course slight increase in length, extra cost for elbows and labor and increased liability to leakage. Besides this there comes in, particularly with engines having drop cut-off, the question of "kicks" in the pipe. There was a Corliss engine in Ledger place, Philadelphia, which caused a pound in the supply pipe that was a nuisance to the neighborhood. Every time cut-off took place the pressure in the pipe was suddenly increased, and there was consequently greater tendency for it to straighten out. When an admission valve opened, the pressure was again lessened and the pipe (which had two right-angled bends in opposite directions in the horizontal plane) tended to take its original crook.

The vibration or knocking kept the pipe (which was about 6 inches in diameter) in a constant quiver. With the cast-iron elbows of the present day this wrenching is not conducive to safety, and breakages of the elbows sometimes occur from this cause. In the old days of malleable fittings this danger was much less. (I remember putting in a large part of a Sunday morning chipping off a 7 inch malleable elbow that had got rusted in place; it was good stock, the chisel was dull and there was nothing to sharpen it with, and there was but little space in which to swing a hammer.) With the fittings of the present day ten minutes' persuasion with a heavy hammer would have cracked the elbow off in fine shape. And by the way, mechanics put in dollars' worth of time unscrewing a rusty fitting that could be replaced for 30 cents; and that, too, when there are plenty like it within a few yards.

As to pipe diameter—of course the higher the pressure the less diameter needed—it is the same here as with port area, but the general tendency is to give too little. I remember of but one case where there was too much, and that was in an electric light works where eight engines were served from one main, which latter had an uncovered horizontal enlargement or drum so out of proportion as to call forth the comment, which the engineer did not at first comprehend, "Why have you put the condenser between the engine and the boiler?" A good rule in this particular is never to give a supply pipe less diameter than that called for by the thread on the engine; that is, never use a reducer. The condensation is of course greater from the surface of a large pipe than from that of a small one, other things being equal; but as the surface of the pipe, against which internal condensation takes place, increases only directly as the diameter, and as the carrying power of the pipe increases as the square of the diameter, the condensation loss is not so much increased by increase in area of cross section as by increase in length; and if the pipe is properly covered, as it should be in any case, the loss from radiation should be but slight with any reasonable sort of a mount.

Where there are changes in direction in a pipe line, it is better to use bends than elbows. There are to be had bend fittings in malleable iron with very gentle curves; these obstruct the flow of steam much less and cause less hammering and vibration than elbows. Bends may also be made in the regular pipe, but this (I am speaking of welded iron pipes) is apt to be done in such a way as to weaken the pipe; and it is better to buy bend fittings and use straight pipes than to use straight fittings and bend the pipes.

With the copper steam pipes of course bends can be made quite readily, but great care should be taken not only in the brazing and even dovetailing of the seams, but in the manner of fastening the bent sections to the straight reaches.

As to material of supply pipes, lap welded wrought iron is most common except on shipboard, where butt brazed copper is usually employed. Some of the iron pipe in the market is quite rough on the inside; some has a good smooth finish, which is usually the better iron of the two, besides which there is a trifle less friction loss, especially in smaller diameters. Where copper is used the seams should properly be dovetailed as well as brazed; and special care should be taken in cleaning the edges and surfaces to be joined, as many welds and brazes are very deceptive, sometimes only a half or even only a third being in actual good holding contact.

In the matter of position, as far as the engine is concerned it is better to lead the supply pipe up from the bottom instead of letting it enter from the side or even from the top. This greatly lessens the amount of water of condensation or of entrainment which can get into the cylinder. Of course this calls for a trap in the under reach, except in such cases as those where the boiler is below the engine level—an arrangement quite common in breweries and elevators. A good instance of the supply pipe coming under the cylinder of a horizontal engine is seen in Jewell's Mills, right close to the Brooklyn end of the East River Bridge. And by the way, if that engine is now in the condition in which it was when I last saw it, it is well worth a visit and close inspection. It is not usual to give engines a finish of coach varnish and gold striping, but that one has, and deserves it, and its mechanical condition is fully up to its artistic appearance.

Every supply pipe should be covered with a good non-conductor, properly applied, and white in external color. I do not propose to bring on me, at this distance from the publication office, a controversy as to which is the best pipe covering. Most of those in the market are good, and most of them are very badly applied; but none of them are so badly put on that they are nearly as bad as no covering at all. Whatever covering is put on should be of such a character and so put on as to be readily removable and replacable, especially at joints; and more especially at flange joints than at screwed ones. And whatever material is used, the more air space there is between it and the pipe the better. That is, if you are going to use a given weight of material, it is better to put it on thin with dead air space than thick without any such dead air space. Nearly every covering in the market can be put on with an air space.

Where a supply pipe crosses in the open air between two buildings, especially in cold countries, the non-conducting covering should be of extra thickness, and as this adds to the weight it is well, if the pipe is at all long, to truss it. Trussing is usually better than underneath supports, as these are often in the way of teams, or prevent the utilization of the space for storage purposes.

Every supply pipe should have, besides the throttle at the engine, a back valve close to the boiler; and it is best that this should be of such a character that the pressure of the steam from the boiler tends to hold it shut rather than to force it open. It is much more dangerous (except perhaps in the case of link motion engines, most of which can be stopped without the throttle) to have a valve stuck open than stuck shut. A very valuable contrivance is one which permits the steam supply to be cut off by electrical agency from any part of the building in case anyone is caught in transmission or machinery, or in case (as sometimes happens) the engine starts to run away and the engineer is not at his post or deserts it for fear.

As to the thickness of the supply pipe, few errors are made in the direction of danger with wrought iron pipes, but large copper ones, as for marine purposes, are seldom strong enough to allow a good factor of safety in the seams, especially where they are very tortuous. Old Matthew Baldwin's rule for strength of a locomotive, "design her strong enough and then put in another ton of iron," might with advantage be studied in this connection.—*Power and Transmission.*

Buchanan Perin and Frank D. Goodhue have been appointed receivers of the American Constitution Printing Company, Cincinnati, Ohio. Liabilities, $4,000; assets, about $5,000.

Montreal, Que., has decided upon having a World's Fair in 1896. The Montreal Exhibition Company and a syndicate of London capitalists are expected to furnish the funds. A company has already been incorporated, and the primary capital is $500,000. Chicago's experience seems to have no deterring influence.

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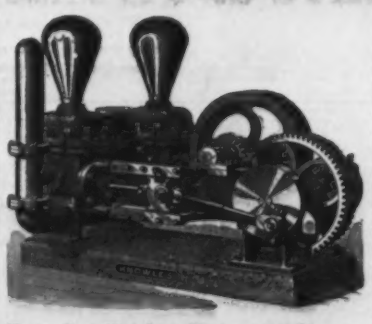

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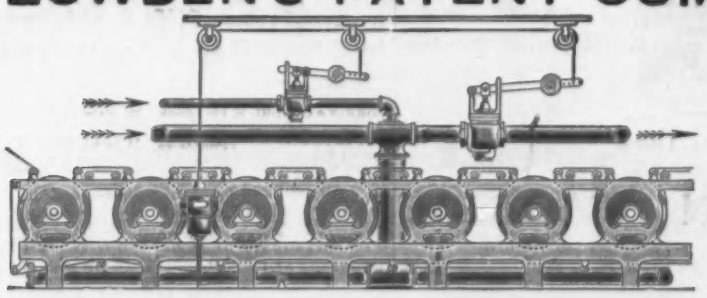

CAN be applied to paper machines where *exhaust is used or exhaust and direct steam combined, and relieving engine from back pressure* in the operation. Paper can be made with a great saving of steam; it insures uniformity in drying, freedom from water streaks and will go to the calenders in proper condition to produce a handsome finish, which are important points in paper making.

We can refer to numbers of paper makers who have been using these Regulators three to four years on their paper machines.

SEND FOR DESCRIPTIVE CIRCULAR WITH FULL INFORMATION.

JAMES J. LOWDEN
Patentee and Sole Proprietor,
37 LANCASTER STREET, BOSTON, MASS.

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Royal Pulp and Paper Co.,		East Angus, Quebec.
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Crocker Mfg. Co.,	5 Regulators,	Holyoke, Mass.
Norman Paper Co.,	4 "	" "
Nonotuck Paper Co.,	4 "	" "
Franklin Paper Co.,	2 "	" "
Riverside Paper Co.,	6 "	" "
Lindon Paper Co.,	2 "	" "
Agawam Paper Co.,	3 "	Mittineague, Mass.
Mittineague Paper Co.,	2 "	" "
Lake George Paper and Pulp Co.,		Ticonderoga, N. Y.
Warren Mfg. Co.,		Riegelsville, N. J.
Denver Paper Mills Co.,	2 Regulators,	Denver, Col.
Platte River Paper Mills Co.,	2 "	" "

Electric Power.*

By D. Sibley-Bigge.

The attention of electrical engineers in England has of late been so much taken up with the design, laying down and starting to work of central electric lighting stations in different towns, and electric lighting work in general, that the question of applying electricity for power purposes has certainly not received at their hands the same amount of investigation that it has from our Belgian and Continental friends.

Such countries as Switzerland and Northern Italy are exceptionally situated as regards natural sources of power, such as water, and it was only to be expected that they should take a lead in transmitting electricity to be utilized for power purposes in the driving of factories, &c.; and indeed a considerable amount of work has already been carried out by the Oerlikon Company, Messrs. Ganz, of Buda-Pesth; Messrs. Siemens & Halske, of Berlin, and many other well-known firms in this direction.

The economy to be derived from driving factories or works elcctrically, utilizing water as our source of power, requires but little comment from the author, as the advantages cannot but be self evident to any engineer; but electricity has done much to enhance the commercial value of water power. Hitherto valuable power in the shape of waterfalls, situated in distant hills and inaccessible places, has been allowed to run to waste for years, and would be doing so still were it not for the advent of electricity, which has provided such simple and economical means for the conversion of this power, its transmission over enormous distances with trifling loss, and its application to almost any industrial undertaking at the far end of the line. The great Niagara scheme will doubtless furnish the best illustration of such a utilization of force. The author has often thought that in countries where no very large water power exists, such as the powers available in the counties of Lancashire and Yorkshire, turbine dynamos might be laid down at the different falls, and the power distributed to one collective centre, where the greatest demand for current would arise; in this way many falls, which, though formerly employed in the driving of factories, have been abandoned owing to their distance from main lines and high railway dues, would again be brought into use. There are, however, many, if not the majority of countries, in which water powers are few and far between, and the next best means for the economical driving of works has to be considered. The author has already pointed out, and laid great stress upon, the utilization of waste furnace gases for producing steam in the boilers connected with the electric generating plant; in those cases where such a course is feasible, the cost of production per unit of electrical energy must necessarily be very low, and in order to arrive at a figure it would be necessary to put a fixed value upon the quantity of waste gases used for firing the boilers, providing steam for running the electric generators at a fixed load, and, for a given time, the cost of wages, oil, waste, upkeep and incidentals could be arrived at in the usual manner.

The question of cost of production of electricity to be employed in driving engineering works, steel works, ship yards and factories of any description must necessarily be of the first importance when considering an application of electric power; and in order to convey an accurate idea of the probable cost the author will refer to some of the Board of Trade returns of electric lighting stations in England for 1893, showing what has been the cost of production to different companies:

COST OF PRODUCTION AND DISTRIBUTION PER UNIT DELIVERED TO CONSUMERS.

	Company. Liverpool.	Company. Westminster.
Total horse power capacity of engines	3,800	4,530
Coal	.99d.	.78d.
Oil, waste, water, engine room, stores and carbons*	.16d.	.19d
Salaries of engineers and wages	.39d.	.93d.
Maintenance and repairs	.64d.	.35d.
Totals	2.11d.	2.27d.

* Low tension.

	Company. Newcastle District.	Company. Newcastle Supply.
Total horse power capacity of engines	1,200	1,200
Coal	.83d.	.83d.
Oil, waste, water, engine room, stores and carbons*	.23d.	.18d.
Salaries of engineers and wages	.85d.	.77d.
Maintenance and repairs	.14d.	.53d.
Totals	2.10d.	2.11d.

* High tension.

From the above table it will be seen that the cost of production, including coal, oil, waste, water, salaries of engineers and wages, repairs and maintenance, amount in the case of the Liverpool company to 2.11 pence, and in the Newcastle companies to very much the same figure. The Westminster company has a cost of production of 2.27 pence. These figures are about the lowest that have yet been attained in England, where coal has been used in the production of electricity.

From the figures given above the ratio of the expenditure for coal compared with the total cost of production can be deducted and will be found very interesting. The Newcastle Supply Company has the very low figure of .63 out of 2.11 set down for coal, but coals are sometimes cheap at Newcastle, and this is perhaps an exceptional case. It is hardly correct to compare an electric power station with an electric lighting station, but it may be taken that in power work where it is possible to use larger generators than is usually advisable in electric lighting stations the cost of production should be rather less than more, and when waste furnace gases are available the cost of production should certainly not exceed 1 penny per unit of 1,000 watt hours.

In laying out new works which are intended to be driven electrically, or even in remodeling old ones, it is necessary to have a correct knowledge of what working efficiencies one may reasonably expect from various sized dynamos and motors, in order to be able to form an exact opinion as to the power it is necessary to provide in order to drive the works. The author's own experience in these matter would lead him to suggest that for large sized power generating dynamos of 300 horse power, 500 horse power, 800 horse power and 1,000 horse power, an efficiency of between 90 per cent. and 92 per cent. may be expected.

In the case of motors the following:

For 3 h. p. motors an efficiency of 78 per cent.
" 5 " " " 80 "
" 8 " " " 84 "
" 11 " " " 86 "
" 16 " " " 87 "
" 20 " " " 87 "
" 40 " " " 89 "

As to the loss in transmission through heating of cables, leakage, &c., this should not exceed 3 per cent. in cases where the motors are situated at distances from the generating source of not more than 300 yards, and 5 or 6 per cent. in cases where the distance does not exceed 500 yards. This, however, cannot be taken as a hard and fast rule for every case, but it will be found to apply in the case of most works, and the expenditure of copper in the mains will not be found to be prohibitive.

The main and great advantages to be derived from electric driving in works may be summarized as the following:

1. The concentration in one highly economical plant of the generation of power for the whole of the works and great reduction in coal consumed per unit of work done.
2. Reduction in wages, owing to the very small number of officials required in connection with such a plant.
3. Transmission of the energy generated, with very trifling loss, to the different parts of the works.
4. Absence of main shafting, countershafting, pulleys, bearings and belts and heavy cost of upkeep in connection therewith.
5. Absence of long lengths of steam pipes and losses due to condensation.
6. Absence of scattered and separate boilers.
7. Absolute control over the economical running of the work, owing to the self-indicating nature of electric motors, and the immediate detection of any undue losses which so often occur in mechanical forms of power transmission.
8. Great economy in work of an intermittent nature and varying loads, a direct proportion between the indicated horse power of generating engine and work given out by motors being obtained.
9. Very small cost and size of foundations involved in works driven electrically.
10. Great facility for alterations and extensions, without any modification being necessary to the original plant.

The points referred to above are perhaps the most salient, but there are many others which appear on the surface in practical work.

(To be continued.)

* Read at the August meeting of the British Iron and Steel Institute.

A recent Austrian patent for insulating material is as follows: Ozokerite, asphalt and amber are subjected to distillation in a closed still to a temperature of 400°. After the mass has been heated until gases, vapor or oils cease to escape, it is allowed to cool. In that condition it is of pliable consistency, and may be used either alone or incorporated with other substances for insulating cables, such as resins, fats or oils, the proportions of these being from 30 to 70 per cent.

Electricity in Machine Shops.

Hand power, where general but a few years ago, is being gradually displaced. In steam, compressed air and electricity we have the divided honors or means of modern applied forces. In many of the more important or advanced machine shops compressed air is being largely used, with the question open as to whether electricity could not be used to better advantage, especially where electric lighting has already been introduced. In some shops it is proposed to add an electric power plant to the air plant in use, the latter being specially serviceable in the driving of small tools and the former in the handling of overhead cranes, transfer tables and the heavier tools.

The *Age of Steel* is the authority for saying that use of electricity in some large European plants has, in an economic and practical sense, been declared a success. In some shafting has been entirely dispensed with, and in the speed of the tools driven, the utilization of space and the general cleanliness and comfort of the shops, the change is met with marked favor. Where most successful the use of a common electric light plant is in connection with other forms of service. A motor is applied to each of the several machines, thus avoiding a waste of power when but few are in use. The current is, in fact, on tap, and can be used or shut off at discretion. The conviction, however, is general that with the advantages claimed for electricity—at least in this country—the question of expense has still its serious phases, while the complications and delicate mechanism of the motor itself is as yet liable to rapid depreciation by the nature of the rough usage it might have to stand.

Progress, has, however, been made on this line, and motors more generally suitable for the average machine shop are procurable. The difficulties in the way are not beyond removal. Electrical science is yet in its infancy, and its varied applications are in many cases simply experimental or preliminary. What there may be of default in the mechanism used and of a lapse in the economies anticipated it is reasonable to suppose will be corrected or removed. It is plain that as the pressure of competition will eventually drive hand power into a corner, the resort to electricity or other means of power is inevitable. In

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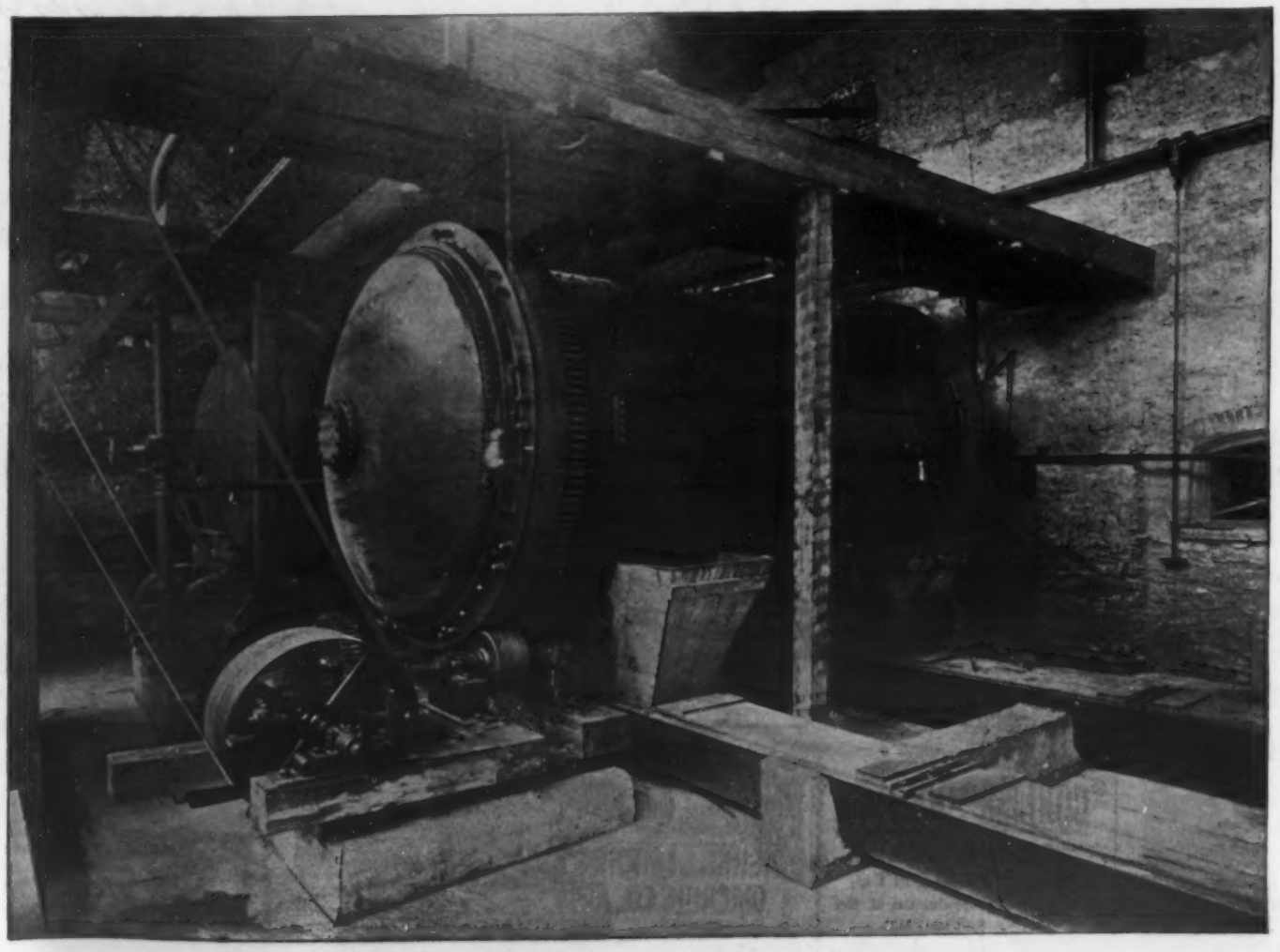

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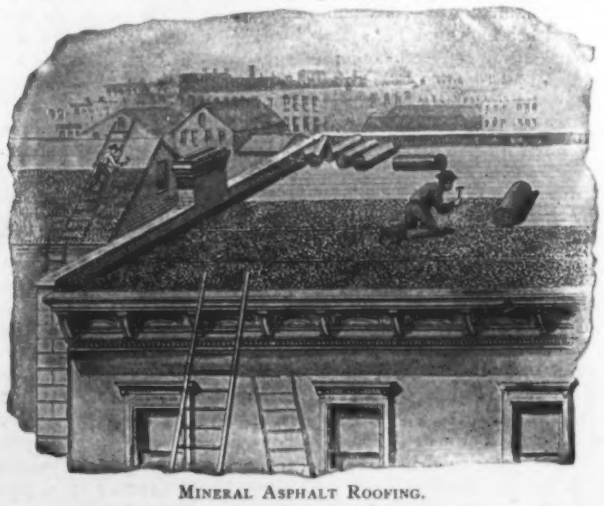
this escape electricity will, without a doubt, be a leading factor.—*Manufacturers' Gazette.*

Mineral Asphalt Roofing.

The Western New York Manufacturing Company, Tonawanda, N. Y., is manufacturing a roof covering which is known as "Mineral Asphalt Roofing." This material is made from pure Trinidad asphalt laid on a foundation of heavy Scotch burlap backed by heavy roofing paper. When in position on a roof it is finished with clean, white sea gravel. This roofing is not affected by severe heat or cold, or by



MINERAL ASPHALT ROOFING.

sulphur fumes or other gases. It is flexible and retains this quality without powdering or disintegration, and is said to be fireproof. Manufacturers who have used this roofing material bear strong testimony to its satisfactory qualities. The illustration shows the method of laying the roofing. Further information may be had by addressing the manufacturer.

Cost of Power.

The cost of power in the average shop, especially in the small shop, is often an unknown quantity. So long as the engine turns over and does its allotted work all is well, and very little thought is given to the possibility of better results were time and attention devoted to their attainment. Several years ago in a presidential address delivered before one of the prominent English engineering societies, it was stated that in an investigation instituted at that time by the corporation of Birmingham, when considering whether they should approve a proposal to lay down power distributing mains in their streets, it was found on indicating a number of steam engines, taken indiscriminately from among users of power, and ranging from 5 horse power up to 30, that the consumption of coal in one instance was as high as 27¼ pounds per horse power per hour, and that in no case it fell below 9.6 pounds, the average being about 18 pounds.

These figures may appear grossly exaggerated, but as a matter of fact, says the *Iron Industry Gazette*, from which they are obtained, they can be found duplicated in many cases. The user of a small engine is often much inclined to argue that the preventable wastes incurred in its operation are necessarily proportionately small, and hence not worth bothering about. He may be perfectly aware of the evils of small or poorly run steam mains and exhaust pipes, leaky and imperfectly adjusted valves and various other points affecting good economy, and yet, though his outfit be afflicted with them all, he will be quite content to let things go on as they are rather than incur the inconvenience and expense, however slight they may be, of a little overhauling. After all, perhaps he may not be fully conscious of how much his carelessness is really costing him, and it is generally not until the matter is figured out for him and put in the form of dollars and cents that he will properly recognize the error of his ways.

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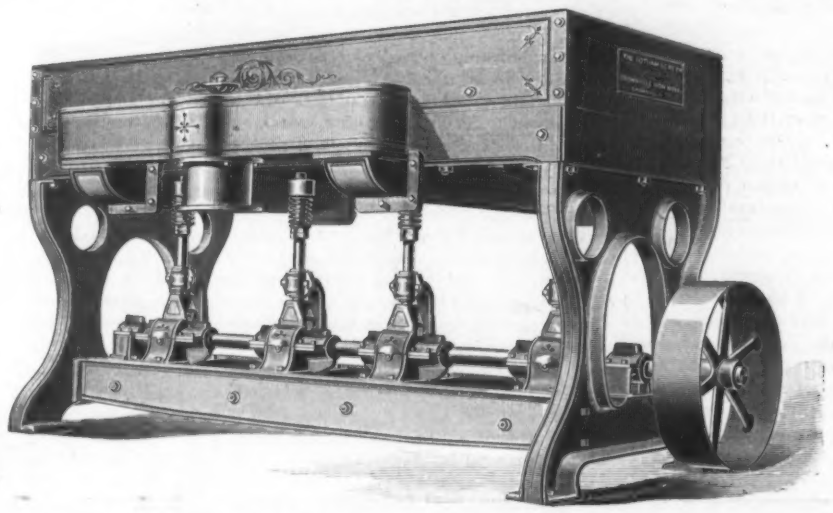

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The Niagara Falls Paper Co.	Niagara Falls, N. Y.	18	.
High Falls Sulphite Pulp Co.	Potsdam, N. Y.	10	..
The Empire Pulp Co.	Black River, N. Y.	1	..
Globe Paper Co.	Brownville, N. Y.	2	..
Union Pulp Co.	Carthage, N. Y.	1	..
Frontenac Paper Co.	Dexter, N. Y.	1	..
Leonard & Gilmore.	Dexter, N. Y.	1	..
Outterson Paper Co.	Brownville, N. Y.	3	3
Oswego Falls Paper Co.	Fulton, N. Y.	5	5
Gouverneur Wood Pulp Co.	Gouverneur, N. Y.	4	4
Knowlton Paper Co.	Watertown, N. Y.	1	..
Ontario Paper Co.	Watertown, N. Y.	5	3
Herkimer Paper Co.	Lyons Falls, N. Y.	4	3
G. H. P. Gould.	Port Leyden, N. Y.	1	..
Gould Paper Co.	Port Leyden, N. Y.	3	2
Racquette River Pulp Co.	Colton, N. Y.	3	..
Sparks Mfg. Co.	Hamburg, N. J.	1	..
Charles Callender	Glendale, Mass.	2	2
Merrimac Paper Co.	Lawrence, Mass.	2	2
Connecticut Paper Co.	Holyoke, Mass.	1	..
Carew Mfg. Co.	South Hadley Falls, Mass.	2	2
Rice, Barton & Fales.	Worcester, Mass.	5	2
Eaton, Dikeman & Co.	Lee, Mass.	1	..
Fall Mountain Paper Co.	Bellows Falls, Vt.	13	8
Wyman Flint & Sons	Bellows Falls, Vt.	3	2
National Metal Edge Box Co.	Readsboro, Vt.	1	..
Glen Mfg. Co.	Berlin Falls, N. H.	10	8
Wilder & Co.	Ashland, N. H.	1	..
Umbagog Pulp Co.	Livermore Falls, Me.	2	..
Bangor Paper Co.	Bangor, Me.	4	..
Jay Paper Co.	Jay, Me.	1	..
White & Wells.	Waterbury, Conn.	2	2
St. Cloud Paper Co.	St. Cloud, Minn.	1	..
Columbian Paper Co.	Buena Vista, Va.	2	..
Anderson Paper Co.	Anderson, Ind.	3	2
Kaukauna Paper Co.	Kaukauna, Wis.	1	..
Willamette Pulp and Paper Co.	Oregon City, Ore.	13	6
California Paper Co.	Agnew, Cal.	1	..
Tennessee Pulp Co.	Memphis, Tenn.	1	..
Estate of Richard Carter.	Glendale, N. Y.	1	..
Charles Wackerhagen	Canaan Four Corners, N. Y.	1	..
Smeallie, Phillips & Co.	Amsterdam, N. Y.	1	..
O. E. Martin	Norwood, N. Y.	1	..
Jefferson Paper Co.	Black River, N. Y.	3	3
St. Lawrence Paper Co.	Dexter, N. Y.	3	3
Payn & Blinn	Chatham, N. Y.	1	..

HOUSES.	CITY AND STATE.	SCREENS.	ORDERS.
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Victoria Paper Co.	Fulton, N. Y.	2	2
Philip McGuire	Forestport, N. Y.	1	..
Hartland Paper Co.	Middleport, N. Y.	1	..
Standard Pulp Co.	Jennie s Falls, N. Y.	3	..
Bacon Paper Co.	Lawrence, Mass.	1	..
Watertown Paper Co.	Watertown, N. Y.	3	3
Alpena Sulphite Pulp Co.	Alpena, Mich.	4	3
Hollingsworth & Whitney	Winslow, Me.	4	3
Fulton Paper Co.	Fulton, N. Y.	2	2
Lyonsdale Paper Co.	Lyonsdale, N. Y.	1	..
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Racquette River Pulp Co.	Potsdam, N. Y.	4	3
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Remington Paper Co.	Watertown, N. Y.	8	3
F. E. Robinson.	Carthage, N. Y.	2	..
Niagara Paper Mills.	Lockport, N. Y.	1	..
Brownville Paper Co.	Brownville, N. Y.	1	..
Indurated Fibre Co. of New Jersey	Lockport, N. Y.	1	..
Cushnoc Fibre Co.	Augusta, Me.	2	..
Adirondack Water Power and Paper Co.	Malone, N. Y.	1	..
Manayunk Paper Co.	Manayunk, Pa.	1	..
C. R. Remington & Son Co.	Watertown, N. Y.	3	2
C. G. Haubold, Jr.	Chemnitz, Germany	1	..
Sissiboe Falls Pulp Co.	Sissiboe Falls, Nova Scotia.	1	..
Delphos Pulp Co.	Delphos, Ohio.	1	..
Barclay Fibre Co.	Saugerties, N. Y.	3	..
Napanee Pulp and Paper Co.	Napanee, Ontario.	2	..
J. H. Horne & Sons.	Lawrence, Mass.	1	..
York Haven Paper Co.	York Haven, Pa.	4	..
Glens Falls Paper Mill Co.	Fort Edward, N. Y.	7	..
J. & J. Rogers Co.	Ausable Forks, N. Y.	1	..
S. D. Warren & Co.	Cumberland Mills, Me.	1	..
Copsecook Mills.	Gardiner, Me.	1	..
Manufacturing Investment Co.	Appleton, Wis.	1	..
Carolina Fibre Co.	Hartsville, S. C.	2	..
C. E. Hargrave Sulphite Paper Co.	Hinckley, N. Y.	16	..
Friend & Stebbins Mfg. Co.	West Carrollton, Ohio.	1	..
Centralia Pulp and Water Power Co.	Centralia, Wis.	3	..

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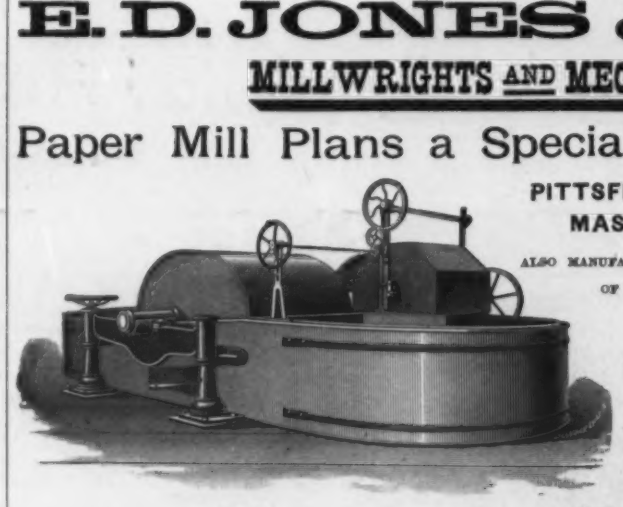

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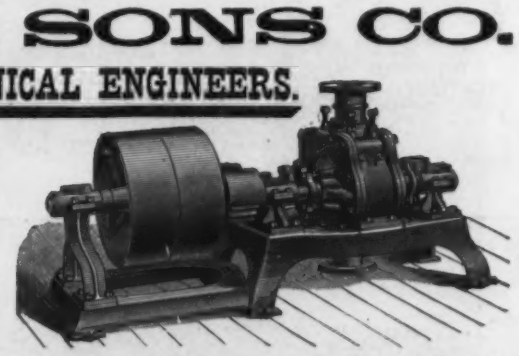

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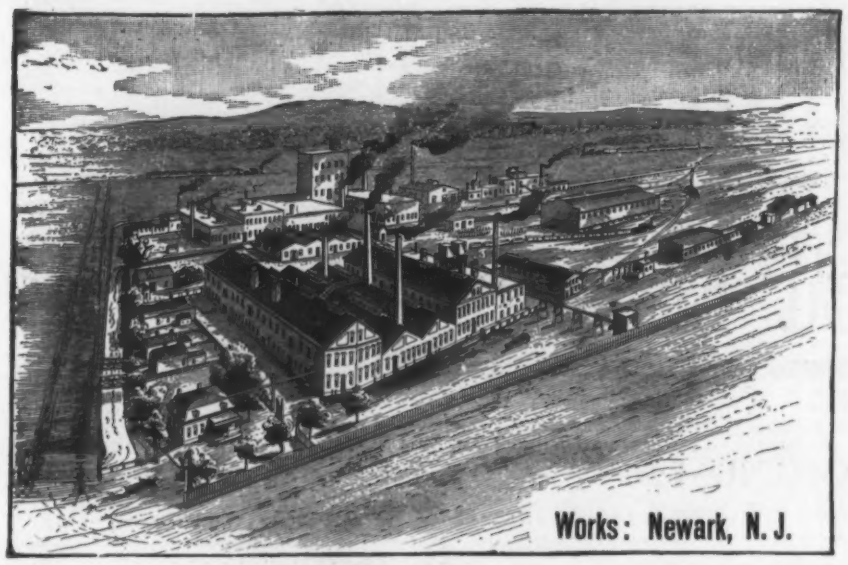

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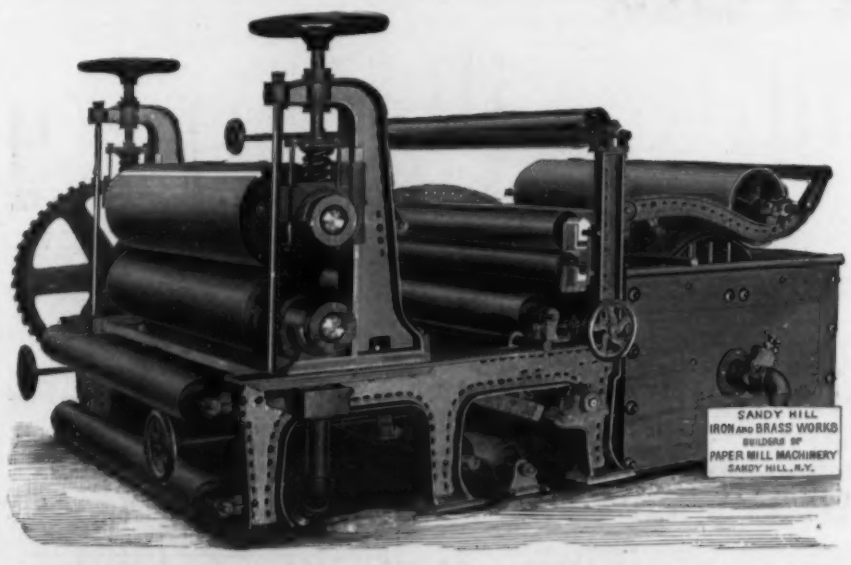

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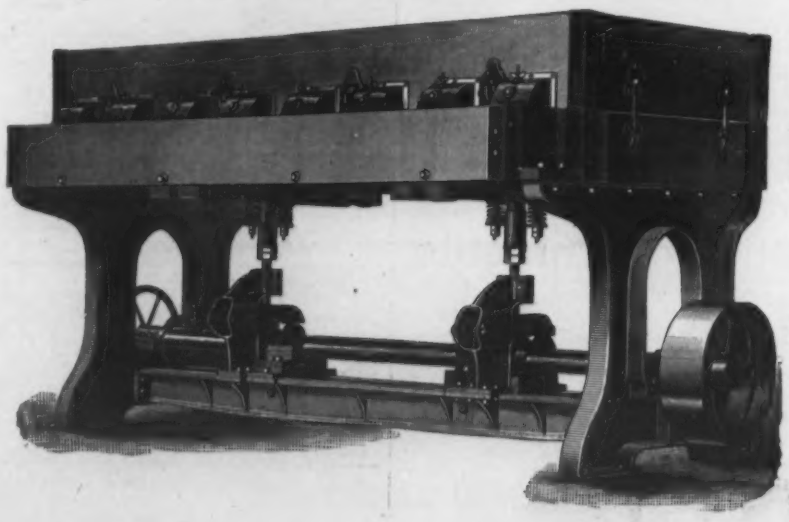

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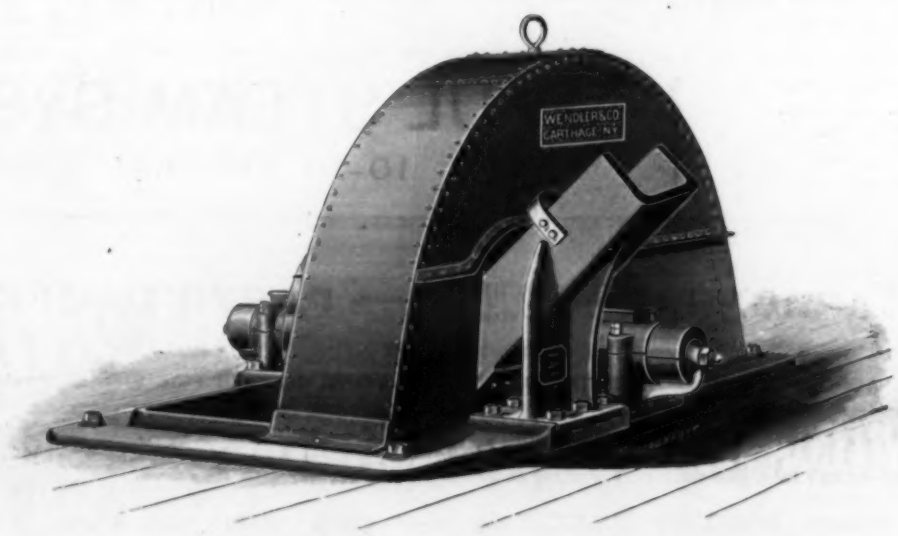

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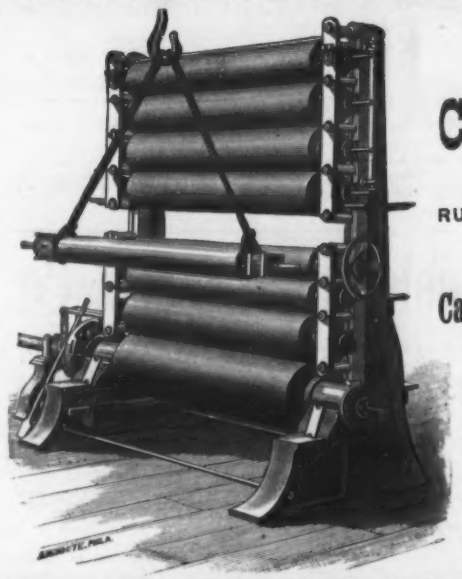

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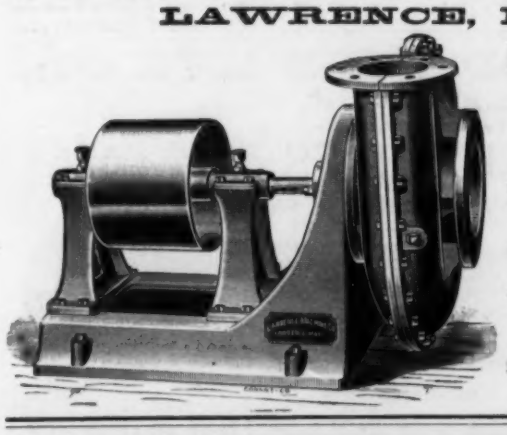

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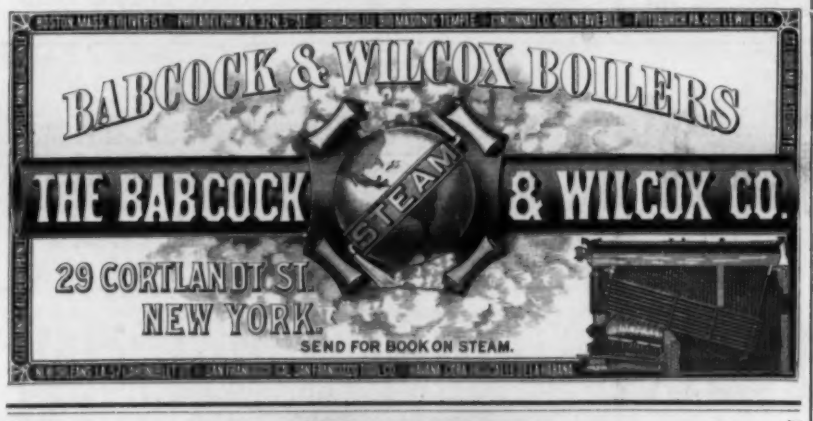

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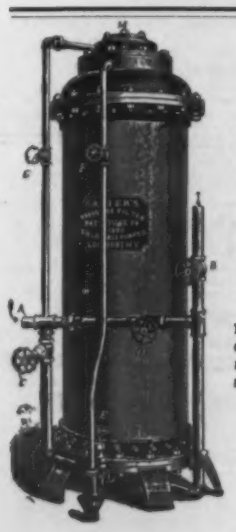

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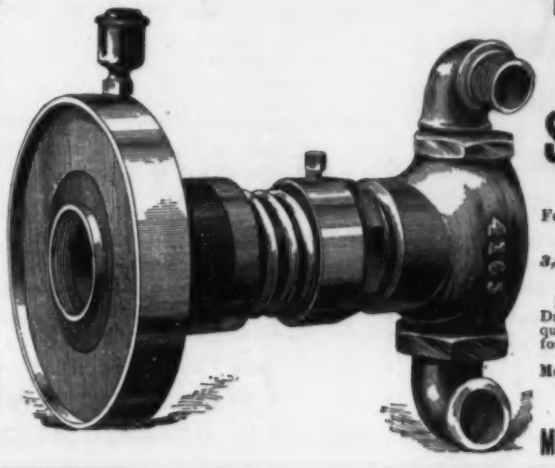

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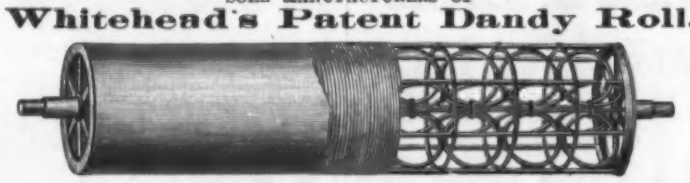

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